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PAPER TRADE JOURNAL

VOL. 123, NO. 9 AUGUST 29, 1946

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WOOD PULP

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No one has yet been able to offer a substitute for that which we have learned to call "Experience." Ability, integrity and responsibility are expected of every business organization — and they are sterling attributes, indeed. But it is experience which is the mother of wisdom and discretion, pointing out the paths to be chosen and the methods to be adopted.

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Champion Elects Reuben Robertson President
Canada Welcomes Newsprint Price Increase
Tissue and Towels Upped Six Per Cent
Puget Sound Profits Up By Half

OPA Lifts Newsprint Ceiling to $74 a Ton
Wisconsin Reservoirs 79 Per Cent Full
Book Paper Rise Is Viewed as Token
B-F-D Buys Ogdensburg Terminal

VACUUM CONNECTION

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with the

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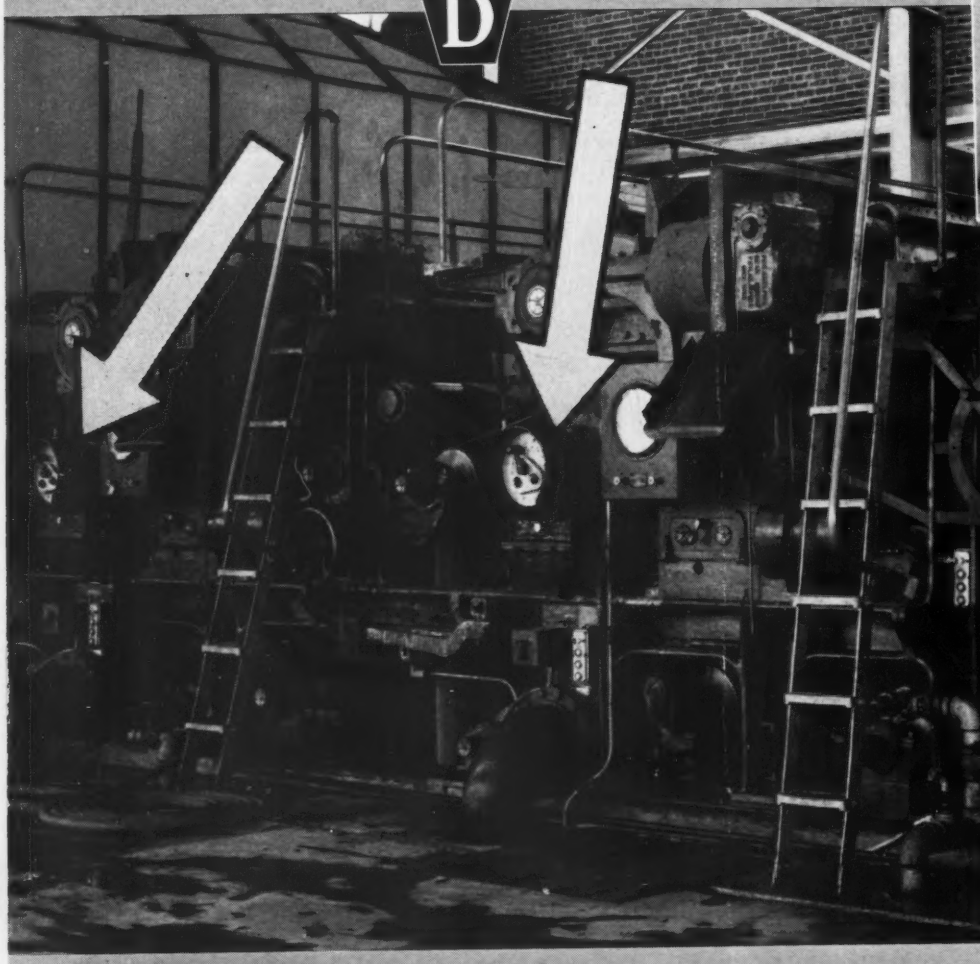

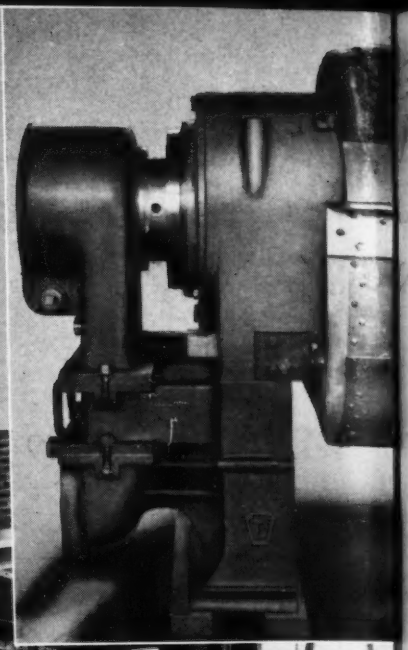

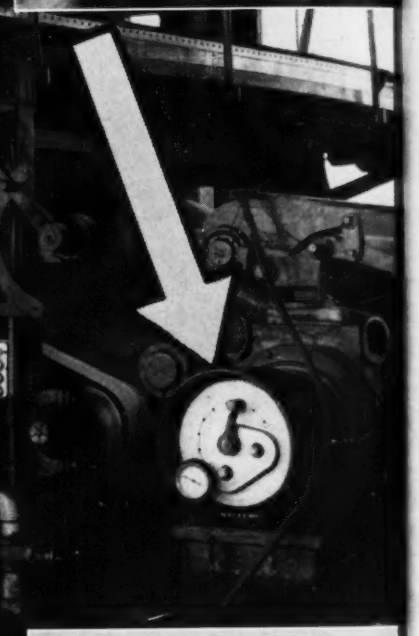

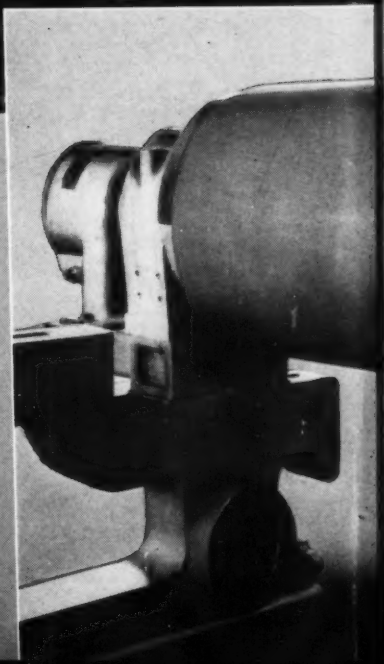

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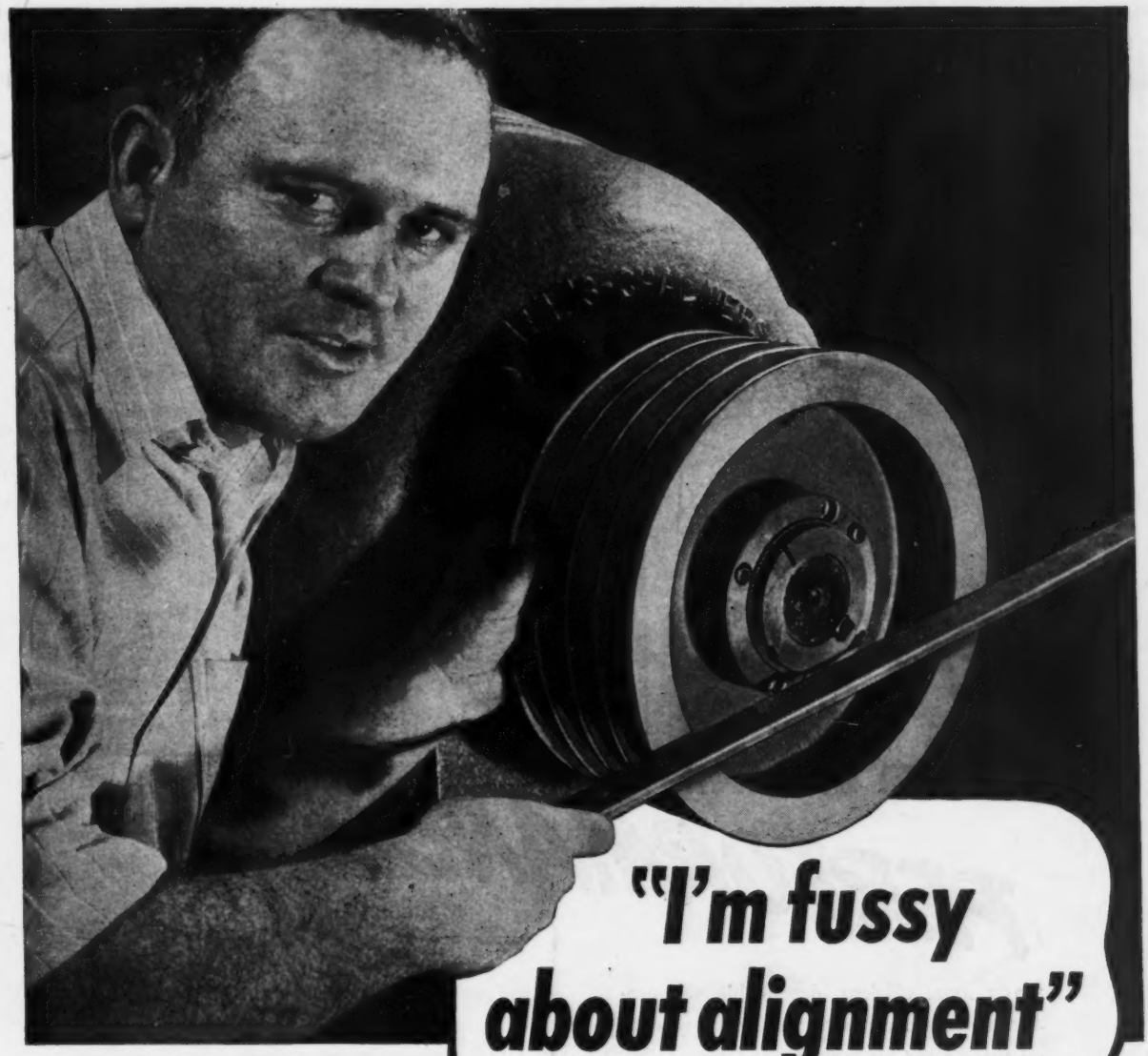

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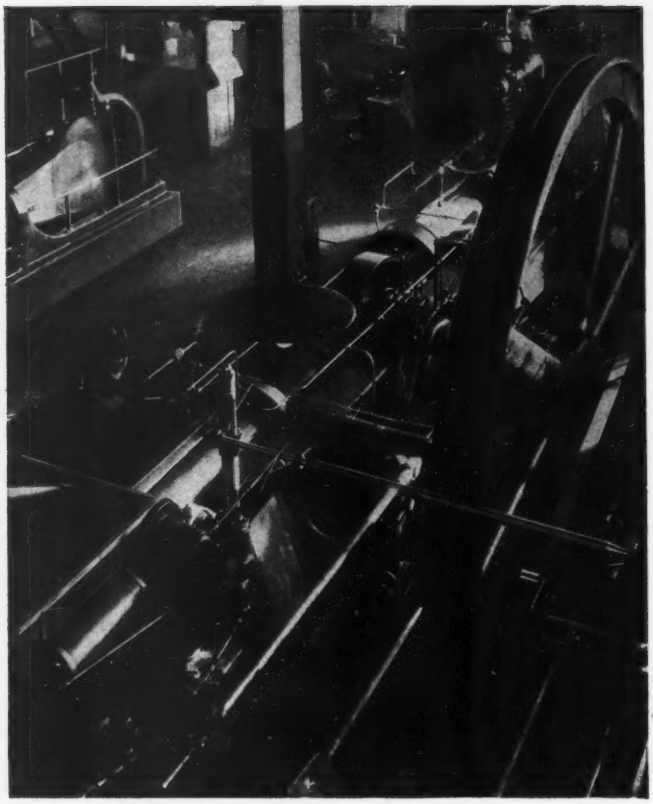

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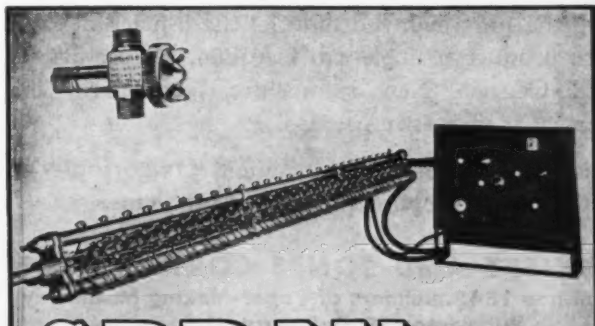

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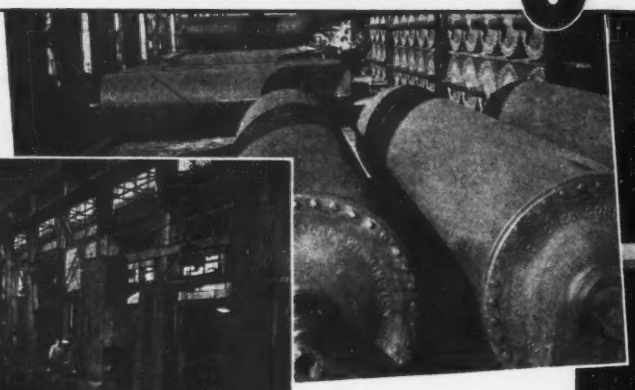

PRODUCTION IN FULL SWING

Take a look at the production floor at Puseyjones. See how men and production facilities are working at full speed to give you the modern papermaking machinery you need.

Each new Puseyjones Machine incorporates the lessons learned in four years of war-time research and development—improvements that mean bigger tonnages for you.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for book and high grade printing, one for white paper for bags, and one for Kraft liner board; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for the manufacture of M. G. Kraft specialties, facial tissues and high grade bristols.

During the next eighteen months these machines will go into production in North Carolina, Massachusetts, Florida, Georgia, New Hampshire, New York, and California, as well as in Mexico.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

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PAPER TRADE JOURNAL

Vol. 123, No. 9 August 29, 1946

Title Reg. U. S. Pat. Off.

Robertson Is Elected Champion President

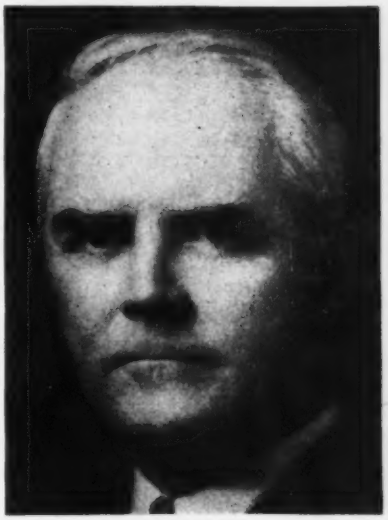
Reuben B. Robertson has been elected president of the Champion Paper and Fibre Company, to succeed the late Logan G. Thomson. Reuben B. Robertson, Jr., becomes executive vice-president. Dwight J. Thomson, son of the late president, was elected a director and vice-president.

Mr. Robertson has been associated with the Champion organization since 1907, when he was assigned to supervise the construction of the company's new southern pulp mill at Canton, North Carolina. Then, after serving as general manager and vice-president, Mr. Robertson became president of the Champion Fibre Company in 1925, serving in that capacity for ten years. He became executive vice-president of The Champion Paper and Fibre Company when reorganization consolidated operations of the Hamilton and Canton mills.

Under Mr. Robertson's direction, Champion has pioneered the development of many new methods in pulp and paper manufacture. Champion led in the use of southern pine for the manufacture of strong white pulp, utilizing one of the South's great forest crops. This naturally led to expanding company operations to the vast pine forests of lower Texas, and the building of a pulp mill at Houston in 1938. Later papermaking equipment was added at this mill.

Mr. Robertson is well known throughout the paper and pulp industry, and is president of the American Paper and Pulp Association. He also has been active in both national and state government affairs. He has been a member of North Carolina section of the Reconstruction Finance Corporation; Committee for Economic Development; the President's Labor Industry Conference, 1942; Business Advisory Council Department of Commerce; and as a member of the National War Labor Board, organized its southern regional offices when the functions of that agency were being decentralized. In state affairs he has been a member of the North Carolina State Planning Board; chairman of North Carolina Wood Utilization Committee of the Department of Commerce; North Carolina Forestry Association; and for 25 years chairman Southern Conference of Human Relations in Industry; and member of Southern Appalachian Research Council. He also has served on numerous civic organizations in Asheville and Canton, North Carolina.

Mr. Robertson was born in Cincinnati and attended the local grade schools and Walnut Hills High School. He graduated from Yale University, and then studied law in Cincinnati before being admitted to the bar in 1903. He has been a trustee of Western Carolina Teachers College and the University of North Carolina. He received an honorary D. Sc. degree from North Carolina State College in 1932.



REUBEN B. ROBERTSON
Elected Champion President

OPA Lifts Newsprint Price To $74. Ton Ceiling

WASHINGTON — Ceiling prices for newsprint sold in the United States were advanced $7 a ton by the Office of Price Administration late last week. The advance applies both to the prices of domestic manufacturers and those of importers. Under terms of this order, sellers may apply the new price rise to all deliveries of newsprint made since August 8, when OPA allowed sales on an adjustable pricing basis.

There were reports that the price action would be followed in the near future by another advance in prices allowed Canadian shippers, who supply about 80 per cent of the newsprint consumed in this country.

The present price advance, bringing prices of newsprint to $74 a ton for newsprint paper delivered to thirty-eight "port" cities, is held to be barely sufficient to bridge the gap between previous prices and the 10 percent differential created when the Canadian dollar was revalued recently.

In its announcement, OPA said that "it had noted that increases had been incurred in costs of raw materials, labor and freight since newsprint ceiling prices were last increased on Dec. 11, last." "The present action is a discretionary adjustment to offset these costs increases, remove impediments to production and assure stable sources of supply," it stated.

OPA has had the price adjustment under consideration for some time. It said that it had granted the rise "to help assure an adequate supply of newsprint for United States publishers by attempting to prevent a diversion to other markets of foreign newsprint normally shipped to the United States, as well as check any tendency on the part of domestic producers to divert newsprint production to other more profitable lines of paper."

Estimating annual consumption of newsprint at 3,250,000 tons, OPA said that representative publishers had advised the agency that they favored an increase in prices to help maintain supplies.

The Newsprint Industry Advisory Committee, representing American newsprint manufacturing companies, recently recommended that OPA grant a ceiling-price increase to meet the present needs, it was added.

Swedish Pulp Arrives At Port of Albany, N. Y.

ALBANY, N. Y. — Among recent arrivals at the local port was the Swedish vessel Parramatta carrying 40,146 bales of wood pulp from Goteborg. An obstruction in the Hudson near Castleton was encountered which caused some difficulty. Other shipments from foreign countries are expected to follow. During the war shipments of the foreign product to the port here virtually ceased.

Canada Welcomes Newsprint Rise

TORONTO, Ont.—The first to take advantage of the new boost for newsprint by the O.P.A. Abitibi Power and Paper Company, Ltd., has notified customers in the United States and Canada that its price for standard white newsprint paper in rolls was increased by 20 cents per ton, effective August 26. Early in July the company, like others, announced an increase of $6.80 a ton and the additional 20 cents a ton brings the price to $74 a ton, which is the new ceiling allowed by the O.P.A. Notices to customers included the comment that this increase of $7 a ton barely offsets revaluation of the Canadian dollar, and does not improve net returns to the company as compared with June, 1946.

The announcement in Washington of the granting of a $7 per ton increase in the price of newsprint applicable to both domestic and import supplies was naturally welcome news to Canadian newspaper manufacturers, as the new reiling of $74 per ton gives them a net price of 20 cents a ton greater than they were receiving before the Canadian dollar was revalued to bring it up to par with the U. S. rollar.

When Canadian newsprint manufacturers raised their prices by $6.80 a ton they were still receiving 10 per cent premium on U. S. fhnds and were negotiating for a further increase of $4 a ton. Then the financial advisers of the Canadian government decided on the revaluation of the Canadian dollar and wiped out the advantages of the new price.

As the matter stands now, the $7 a ton boost allowed puts them back about where they were before the revaluation of the dollar was announced, but they still hope to get another $4, which, they claim, is necessary to compensate for the great increases in costs since the beginning of the recent war.

Scott Advances Dye and Stanton

PHILADELPHIA, Pa.—Donald L. Dye of Ridley Park, has been named to a shift floor manager's position by the Scott Paper Company, Chester. He replaces George Stanton, shift floor manager in the consumers' representatives department since 1942. Mr. Stanton will leave the Chester plant to become chief consumers' representative at the Scott plant at Hoboken, N. J.

Formerly assistant shift floor manager in the department, Mr. Dye came to Scott in 1941, as a testing station operator. In 1942 he entered the Navy and saw action in the Pacific. He held the rank of lieutenant and was commanding officer of a mine sweeper. He returned to Scott in February.

Also first employed at Scott Paper Co. in 1941, Mr. Stanton worked as assistant shift manager. Six months later he was promoted to shift manager. Twelve months later he was promoted to shift floor manager. In his new job he will be responsible for all quality control both in the paper testing station and in converting operations.

Tissue and Towels Upped Six Per Cent

WASHINGTON — Ceiling prices for toilet tissue and paper towels have been raised six percent by the Office of Price Administration. The action, effective August 23, 1946, applies to all levels and is based on an industry-wide increase approved after financial studies by OPA showed that current returns were below base period returns on net worth.

Manufacturers who have been granted individual adjustments may either add the industry-wide increase to their original ceiling prices or continue with the price approved for them individually by OPA, whichever is the higher. Most of the manufacturers were granted individual adjustments, but some small producers, representing only 16 percent of the dollar volume of sales, had not yet taken relief action.

Factors for the action were an increase in wages, averaging two percent on net sales, and the advance of the cost of materials, principally pulp, bringing the required increase to 4.6 percent on sales. Additional factors involved included coal and freight cost increases, and advances in the price of felts, wires, repairs, dyes, chemicals and supplies.

Resellers, to comply with the provisions of the Price Control Extension Act of 1946, are permitted to pass-through the manufacturers' increases by applying the percentage increase over their cost of acquisition.

Philipp Firm Moves Office

NEW YORK—Philipp Brothers Chemicals, Inc., has moved from 70 Pine St. into new larger quarters at 37 Wall Street.

Expanding facilities and a need for more room has prompted the move and the new quarters perfectly fills that need. Philipp Brothers Chemicals, Inc., has branch offices and warehouse stocks in Boston, Providence, Hartford, Philadelphia and Baltimore.

Riegel Orders New Machine

MILFORD, N. J.—The Riegel Paper Corporation has ordered a new glassine and greaseproof paper machine for installation in its mill, already the world's largest manufacturer of these grades of paper. John L. Riegel, President, stated that the Civilian Production Administration has authorized the necessary plant construction and added that the new machine was expected to be in production within 15 months.

Book Paper Rise Is Viewed as "Token"

HOLYOKE, Mass., Aug. 22—"Just a token" is how one Holyoke paper manufacturer today described increases in prices on lower-priced book and writing paper just announced by the OPA. Another local manufacturer declared that in view of the way costs of raw materials and labor have been mounting, the price "relief" granted by OPA is only about one-third of what would be necessary. Price relief was sought by the paper industry through its OPA advisory committee.

The OPA increases, effective now, cover only the lower grades, with the expectation that this will encourage production of these grades.

On rag paper, which forms the bulk of the Holyoke output, the OPA has authorized ceiling increases as follows: 25 per cent rag, $14 a ton; 50 per cent rag, $12 a ton; 75 per cent rag, $10 a ton; 100 per cent rag, no increase. The tapering of the price relief to lower increases as the rag content increases, follows the notion of encouraging production of the cheaper grades. These increases apply to ledger, bond, index, wedding and cover papers. Onion skin, with the exception of 100 per cent ray content, has been increased 10 cents per 1000 sheets measuring 17 by 22 inches.

In the sulphite papers, of which not so much is made in Holyoke, the authorized ceiling increases are: No. 1 sulphite, $71; No. 2, $9; No. 3, $11.

In explaining the smallness of the increases, from the manufacturer's point of view, one mill official today pointed out the various wage increases of the past year, the fact that pulp has risen from about $76 a ton to $94 in the same period, the approximate doubling of prices for rags and casing-lumber and general price increases in chemicals and all materials and services entering into paper manufacture.

Mid-West Waxed Paper Elects New Slate

FORT MADISON, Ia.—Morton W. Denebeim, has been elected president of the Mid-West Waxed Paper Company. Rufus H. Clough and John A. Wesley are vice-presidents; H. G. Decker, treasurer, and R. W. Fahey, secretary. All officers are active in the business and will headquarter at Fort Madison. Preston E. Roberts, the retiring president, will remain associated with the company in an advisory capacity.

The new officers of the company bring to Mid-West a wealth of experience and performance. Definite plans are already under way for the improvement of present products and the addition of new specialty products. These items include bread wrappers, waxed paper printed and plain, candy wraps, household rolls, decorated wrappings, locker paper and other specialties.

YOU CAN DO A BETTER KNOTTING JOB WITH BIRD'S JONSSON SCREEN

The Jonsson Screen handles all kinds of pulp and handles it fast.

It removes the knots whole and clean.

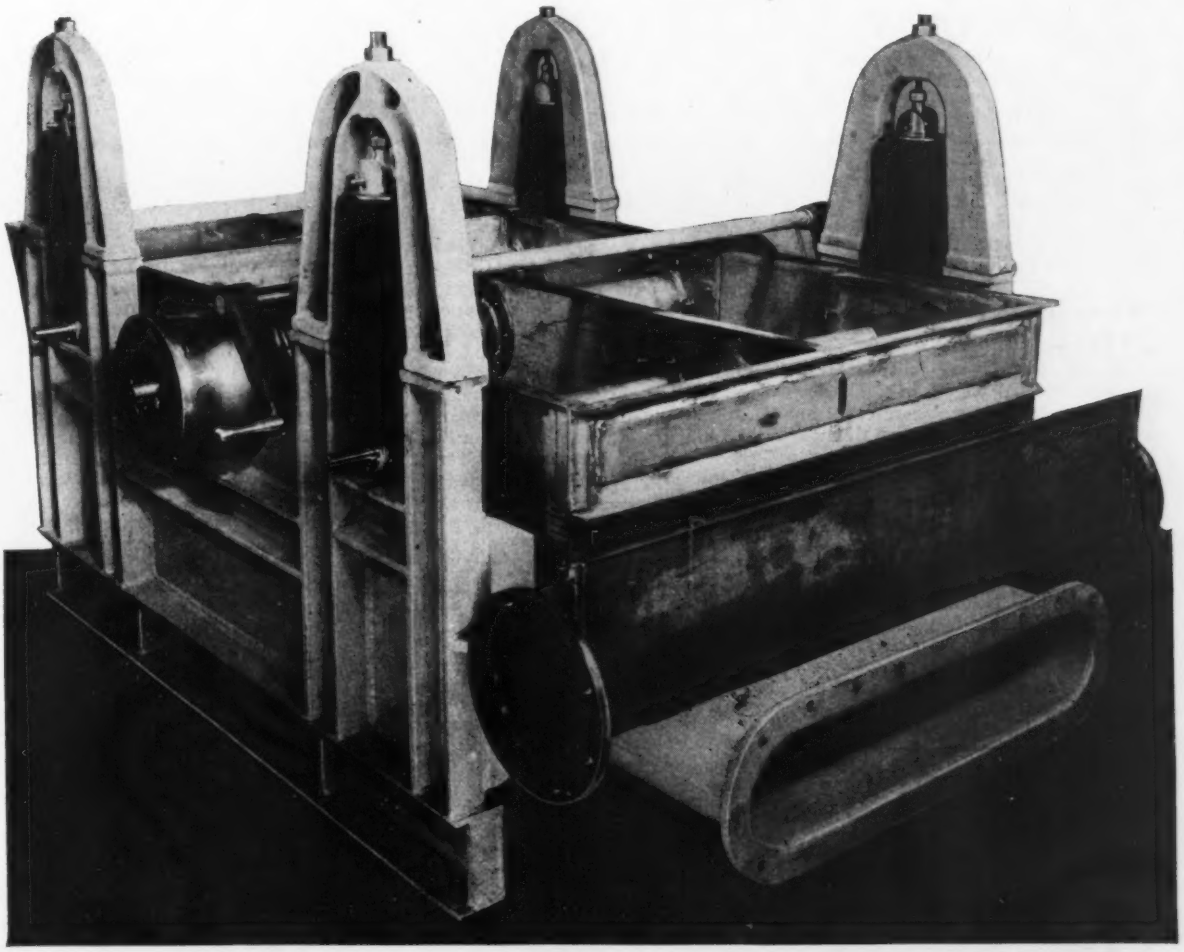
You seldom see a broken knot leaving the Screen.

Loss of fibres in the tailings is exceedingly small.

It's inexpensive to install, operate and maintain.

Once you've had experience with the Jonsson Screen you'll never be satisfied with old type knotters.

Let us show you what it can do for you.



BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Byron Weston Starts Improvement Program

DALTON, Mass.—At ground breaking ceremonies Hale Holden, Jr., president of Byron Weston Company, recently outlined an extensive program of mill improvement with construction starting immediately on a new finishing machinery building. Connecting the two existing units of the Weston mills, the new two-story building which will be of modern design, combining concrete, steel, brick and glass block construction, will provide approximately 25,000 square feet of additional floor space for more efficient arrangement of calenders, trimmers and other finishing equipment. CPA approval was obtained a few weeks ago.

This new construction is part of an extensive program already under way which will include modernization of the paper machines at this mill to provide for increased speed and greater capacity. The first step in this direction has already been taken with the installation of a new Bird Screen on the 112" machine. Installation of a new Victory beater has also nearly been completed. This beater which is considered revolutionary in design and the only one in existence at this time, permits simultaneous treatment of different types of fibres requiring different beating time. It is equipped with automatic devices that maintain precision control during the entire cycle.

Wisconsin Reservoirs 79 Per Cent Full

WAUSAU, Wis.—Wisconsin river reservoirs were depleted of 700,000,000 cubic feet of their water reserves during the week ending August 18, when they were filled to about 79 per cent of their total capacity. The total reserves of August 18 amounted to 13,445,000,000 cubic feet, as compared to 13,281,000,000 cubic feet on the same date in 1945.

The average Wisconsin river flow at Merrill for the 24 hours ending August 21 was 1,874 cubic feet per second, as compared to an average seven-day flow ending on the same day of 1,837 cubic feet per second at the Merrill gauge. This near-normal flow has been maintained with the aid of reservoirs.

Barge Canal Cargoes Rise

ALBANY, N. Y. — Total amount of native pulp wood passing over the Barge Canal route during the first half of 1946 is reported at 67,358 tons which is an increase of 42 per cent over shipments for the corresponding period of last year.

Thilmany Sends Them Up High

KAUKAUNA, Wis.—Steeple jacks are repairing the stacks at Thilmany Pulp and Paper Company. They have completed work on the 212-foot stack at the upper mill.

LEONARD P. TAYLOR, mill superintendent, prefers the old fashioned method of breaking ground for the modern finishing machinery building now being erected by Byron Weston Company. Hale Holden Jr., company president, looks on.

St. Regis Sales Take Over Sulphate Distribution

R. K. Ferguson, president of the St. Regis Paper Company, has declared that effective January 1, 1947, the company's bleached and unbleached sulphate pulp will be sold exclusively by the St. Regis Sales Corporation, the St. Regis sales subsidiary. R. L. Vayo, sales manager of the pulp division, announced that William McNair, assistant pulp sales manager who is now on loan to the Office of Price Administration in Washington, will return soon to reestablish and manage the Chicago pulp sales office.

B-F-D Mill Resumes Sulphite Production

OGDENSBURG, N. Y.—After extensive alterations and expansion, the sulphite plant at the B-F-D Company in this city has resumed production following several months of inactivity. According to Donald A. Hunter, plant manager, the mill now has a daily capacity of 135 tons but is not expected to attain that figure for some time. For the time being the entire output of the mill will be shipped to the Plattsburgh mill of B-F-D where specialty paper products are manufactured.

Kenneth Taylor Joins Crown-Zellerbach

BOSTON, Mass.—Kenneth I. Taylor of Somerville, formerly of Springfield, ex-legislative agent of the Massachusetts State Federation of Labor, is to go to San Francisco, Cal., next month to take a position as public relations representative for the Crown Zellerbach Paper company.

Adirondacks Report Capacity Schedules

COHOES, N. Y. — Capacity schedules are being maintained in the majority of the paper mills in this section with orders booked ahead in most cases. The demand for both skilled and unskilled help has increased during the past few weeks and future prospects are considered bright. Among the mills in the field for workers during the past week were the Imperial Paper & Color Corp., Glens Falls, Wheeler Paper Corp., Albany, and the Ticonderoga branch of the International Paper Co. Improvements are reported under way at the latter place. Orders booked at the Warrensburg Pulp & Paper Co. are said to be sufficient to warrant steady operations for several months ahead and improvements being made will allow increased production. It is understood that the orders handled will be composed mainly of tissue grades of different assortments.

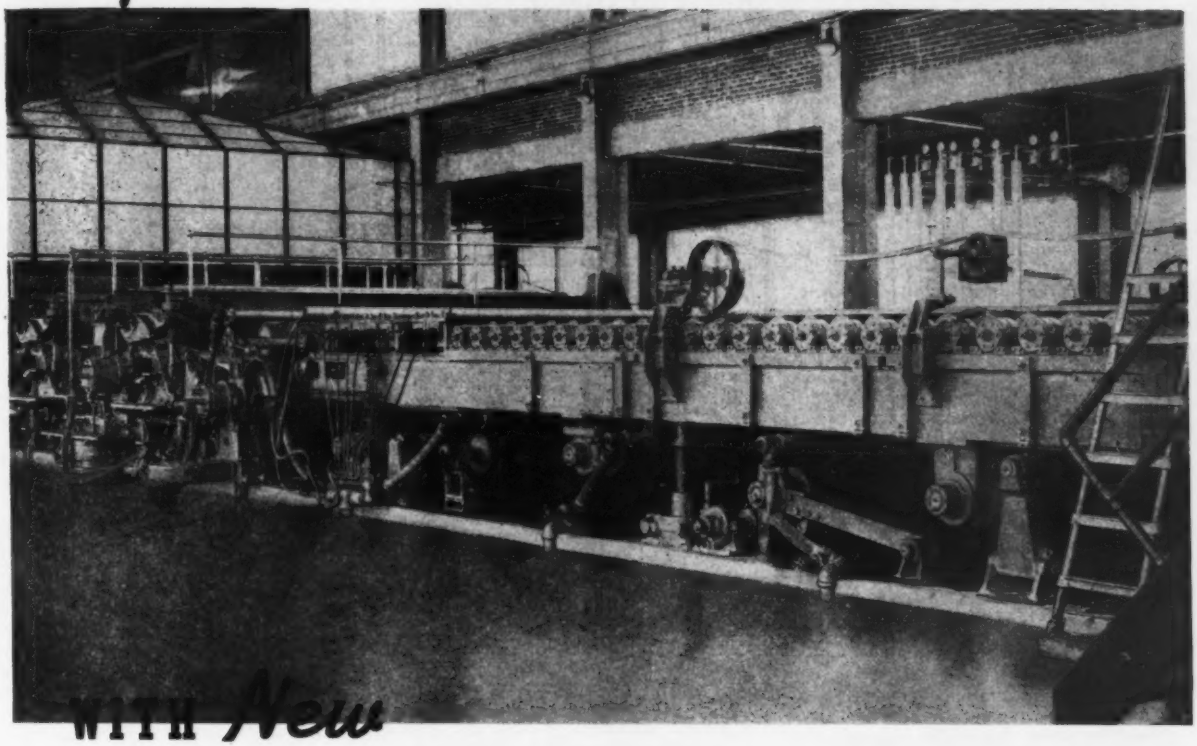
A new plant is now being erected at Ticonderoga which will house a branch of the Rensselaer mills of F. C. Huyck & Sons, manufacturers of papermakers' felts. It is reported that the various operations will be taught to learners in a temporary location in that village pending completion of the new structure. The task of recruiting a working force is now under way. The Rensselaer mills of the firm are running night and day and the decision to expand is believed to have resulted from the heavy influx of orders.

Labor conditions remain quiet following negotiations in many of the mills by labor organizers which resulted in wage increases in many cases. A wage increase was recently granted the Mohawk Paper Mills, Inc., following negotiations with organizers which affects both Cohoes and Waterford plants. The firm employs several hundred persons and is running with day and night schedules. Announcement was made this week in labor circles that the membership of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers has now passed the 100,000 mark. The first local body of the organization was started at Ford Edward in 1901 and in 1906 sufficient locals had been organized to form the International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

Waste Dealers Will Hear Will Rogers, Junior

Will Rogers, Jr., is to address the members and guests of the National Association of Waste Material Dealers, Inc., at its Fall Banquet to be held in the Palace Hotel, San Francisco on Tuesday evening, September 17th. In a way, it is very fitting that he should have been chosen because his father addressed one of the Association's large gatherings in New York about twenty years ago.

Improved Formation Control..

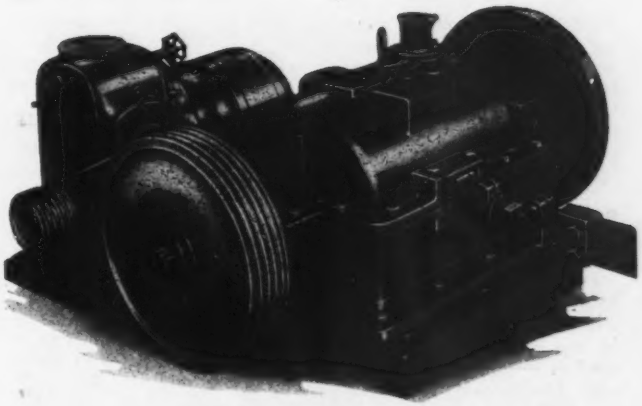


WITH New

SIMPLEX FOURDRINIER AND SHAKE

The Bagley and Sewall Simplex Fourdrinier is designed and built in either the Quick Wire Changing or the Non-Quick Wire Changing type. Either type of Fourdrinier can be put on existing machines. Where speed and changing Fourdrinier wires is of paramount importance, the Quick Wire Changing Fourdrinier is recommended. This feature permits the wire to be changed without the removal of rolls and other equipment.

Ask for our catalogue



A REAL COMBINATION TO MEET QUALITY REQUIREMENTS

BAGLEY B&S SEWALL

THE BAGLEY & SEWALL COMPANY

Builders of Paper Making Machines

WATERTOWN, NEW YORK

Midwest Is Puzzled At Price Formulas

CHICAGO—While some paper trade executives in the Chicago area hailed the return of meats and fats and oils to price control as a necessary step, most Chicago business leaders indicated a regret that the step was taken and that it would eventually mean a longer period of time before all controls are finally terminated. In the trade in general, reports showed exceedingly fine production records on the part of the various mills but no slackening of demand despite the marked increase in prices including newsprint, following recent OPA permission. It was obvious, according to some quarters, that paper buyers were trying to grow more selective in their choice of paper but that substitute grades were still in highly popular spots.

The market was perplexed over the channels new OPA regulations would take and the confusion seemed more marked as hard pressed jobbers were trying to estimate how much absorption would be required of them in the months to come. The retail trade, dealing in stationery, mimeograph paper, typewriter paper and general supplies, was reported to feel that the only possible solution to its dilemna would be permission to pass all increases along to the ultimate consumer.

The waste paper trade locally continued to show surprisingly good results from a collection standpoint though the market was quiet and tonnage brought in was still reported to be far less than needed by mills in this territory. The recent ODT order requiring that waste paper in bales weighing not less than 8000 pounds shall be loaded on end, one tier high, over the entire floor space of freight cars was not expected to restrict wastepaper shipments to any great extent. Other shippers were reported to welcome the various ODT changes as a partial remedy for the genuinely alarming car shortage in the country.

B-F-D Buys Terminal At Ogdensburg

OGDENSBURG, N. Y. — The former pulpwood terminal located about two miles above the city has been purchased by the B-F-D Company and will be used as previously for pulpwood storage. The property was first used as a terminal by the Degrasse Paper Company with a newsprint mill of 160 tons daily capacity at Pyrites. Previous to World War I, the mill and pulp terminal were purchased by the old New York World. Later they were sold to International Paper Company.

In 1928 the International company discontinued both the mill and the pulpwood terminal. The property, consisting of approximately 20 acres, has since been idle. It has docking and unloading facilities for lake vessels and a spur track for reloading pulpwood for shipment by rail.

Mahler Receives Freedom Medal

NEENAH, Wis.—Formal presentation of the Medal of Freedom was made Monday, August 19, to Ernst Mahler, executive vice-president of Kimberly-Clark Corporation. This award was made by the United States government for "exceptionally meritorious" achievement in connection with his work in Europe as chief of the paper and paper products production division of the general purchasing agent for the United States.

Mr. Mahler received the award in his office, the presentation being made by First Lieutenant Thomas H. Scott of the Fond du Lac, Wis., recruiting district and First Lieutenant Ben H. Zeff, director of recruiting of the Wisconsin Recruiting district in Milwaukee, Wis.

The citation accompanying the award read: "For exceptionally meritorious achievement which aided the United States in the prosecution of the war against the enemy in continental Europe as chief of the paper and paper products branch, production division, office of the general purchasi ng agent from January 15 to April 20, 1945.

"His voluntary contribution of his expert technical knowledge of the paper and pulp industry and his willing acceptance of the risks to his personal safety required to apply this expert knowlege to conditions in the field resulted in the recommendation for a proposed continental production program which will save the Allies many thousands of critically needed ship tons."

Nepco Court Relieves Housing Shortage

PORT EDWARDS, Wis.—Nepco Court, Nekoosa-Edwards Paper Company's two-story apartment building, has been completed except for finishing details and landscaping. John E. Aleander, president and general manager of the company, said that the building was constructed to help relieve the housing shortage, and that it was so planned that a third floor may be added.

It is one of the first buildings in the state to have radiant-heating installed. Designed to furnish even heating throughout the eight apartments, the heating system consists of pipes laid under the floor in the first story and in the ceiling for the second story apartments. Steam from the mill is circulated through the pipes by electric pumps located in the general utility room. Temperature is regulated by a therma-ray unit in each apartment.

Price & Pierce Buys for Australia

Price and Pierce, Limited, New York City, and Montreal, P. Q. has been appointed by Australian Paper Mfrs., Limited of Melbourne and Sydney, Australia, as exclusive buying agents in North America for their woodpulp and waste paper requirements.

Indianapolis Trade Sees Little Change

INDIANAPOLIS — Little change was seen in the local paper market last week, but demand continued heavy and supply was still relatively short. Nor does there seem to be any indication now that any change will be seen until after the first of the year, if then.

However, there is a slight improvement in the labor market and manufacturers and jobbers are finding it somewhat more easy to secure help. The average worth of the help, it is declared, is not as good as it was before the war and with the increasing living costs, there have been some complaints about wages, but thus far there have been no strikes in the paper mills of the state.

Every effort is being made on the part of business men and industry to stimulate housing and the roofing and building paper jobbers are hopeful there will be a turn for the better before late fall.

Kraft supplies are becoming scarce in this section and the demand for paper bags and wrapping paper is on the increase. The jobbers are on the anxious seat. Waxed paper is on good demand and will increase as bakers are able to increase their output. Other uses are being found for waxed papers, which will further stimulate the demand.

Newsprint demand was strong last week and with the reopening of schools, will increase in demand. Newspaper lineage is considerably ahead of the same period of last year. Summer specialties last week were in good demand and will continue to move until after Labor Day. One manufacturer of paper cups and other specialties has a vast volume of orders for this fall, but they came from Central and South America and were the direct result of an airplane tour he made with a party of local industrialists during the early summer.

Rag demand continued heavy with better grades most in demand. Paper stock also was moving well and with some strikes settled in New York, the situation is well stabilized.

Kimberly Quartette Joins Foreman's Club

KIMBERLY, Wis.—Four men of Kimberly-Clark Corporation were accepted into the Foreman's Club August 19. They are D. J. Courtney, impregnating plant foreman; G. H. Saunders, superintendent of the chlorine plant; K. J. Heinz, engineer; E. R. Borchardt, tour foreman of the calenders. C. R. Laut gave a report on the training program, and J. T. Doerfler, mill manager, gave a talk on the cleanup in the mill.

Dinner was served at 5:30 and W. H. Swanson, general superintendent, talked on "The Process of Making Sulphite and Sulphate Pulp." Also on the program were George L. Clark and H. A. De Bois.

GOSLIN-BIRMINGHAM

EVAPORATORS

FILTERS

"Standards of Equipment"

for over 30 Years

Efficiency, reliability, low operational and maintenance costs have been for years outstanding and recognized characteristics of Goslin-Birmingham equipment.

The general acceptance of G-B products is a tribute to manufacturing experience and to the consistently fine performance records of pulp and paper mill equipment made by Goslin-Birmingham.

GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.

BIRMINGHAM ALABAMA

350 MADISON AVE NEW YORK

CHICAGO SAN FRANCISCO NEW ORLEANS SEATTLE

Puget Sound Profit Up Fifty Per Cent

BELLINGHAM, Wash.—Puget Sound Pulp & Timber Company reports net profit of $347,838, or 96 cents per common share, for the first six months of 1946, against $211,413, or 54 cents a share, in the first half of 1945. By quarterly periods, net profit amounted to $253,530 for the second quarter of 1946, in comparison with $94,308 in the first quarter of this year and $109,211 in the second quarter of last year.

Net sales and other revenue amounted to $2,763,558 for the first six months of 1946, compared to $3,353,937 in 1945.

Pulp production amounted to 19,817 tons in the second quarter of 1946, and to 15,403 tons in the first quarter, making 35,220 tons for the first half of this year, which compares with 45,840 tons in the first six months last year. Production in June exceeded 8,000 tons, or about 78 percent of capacity, in comparison with an operating rate of about 52 percent of capacity for the first five months of this year.

June business was benefitted by operation of the new hydraulic barker and whole log chipper, from which the company reports 17 percent saving in consumption of logs per ton of pulp.

Formation of Bellingham Paper Products Company was announced, a $460,000 project in which Puget Sound Pulp & Timber Co. will have 75 percent ownership interest. This new company will operate a mill, situated on land leased from the parent concern, capable of producing 45 tons daily of paperboard, used in packaging various food products and numerous other items. At capacity operation, the paperboard mill will consume about 12 percent of capacity output of the pulp mill.

NEPCO Offering to Finance Woods Improvement

WISCONSIN RAPIDS, Wis.—A new $1,785,250 issue of 63,000 shares of $25 par value common stock of Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis., was offered at $26.75 Wednesday, August 21, by Loewi & Company and associates. Proceeds will be used to increase wood inventories, improve recently acquired Canadian timber holdings and for general corporate purposes.

The Marshall and Illsley Bank in Milwaukee has been designated as subscription agent for the purpose of executing preemptive rights of present shareholders. The preemptive rights give shareholders the privilege of buying one share for each four shares held as of August 1, 1946.

Two forms, a notice of their preemptive rights and another for exercising those rights, were mailed to shareholders August 21 along with a prospectus. Shareholders have until August 31 to exercise their preemptive rights. Any sales by the Loewi company and other investment brokers are subject to the amount subscribed for by present stockholders.

Puget Sound Declares Dividend

BELLINGHAM, Wash.—At their meeting held August 21, directors of Puget Sound Pulp and Timber Company declared the regular quarterly dividend of 30 cents a share on the preferred stock, payable October 1st to stockholders of record September 14, 1946, and a dividend of 25 cents a share on the common stock, payable Steptember 30 to stockholders of record September 16, 1946. Including this payment, dividends on the common stock paid or declared thus far in 1946, amount to 75 cents a share. Dividends totaling $1 a share were paid on the common stock in 1945.

Hudson Debentures Offered Publicly

Public offering will be made today of $3,000,000 of 3½ per cent sinking fund debentures of the Hudson Pulp and Paper Corporation. The debentures, due on July 1, 1966, and priced at 100 and accrued interest, will be marketed by an underwriting group headed by the Lee Higginson Corporation.

Proceeds from Hudson Pulp and Paper's new financing, together with about $2,289,000 received from the sale in March of 100,000 shares of preferred stock and additional funds, will be applied to the construction of a pulp and paper mill near Palatka, Fla. Expected to cost $6,500,000, the project will increase to four the number of mills operated by the company.

Capitalization of the pulp and paper concern following the financing will consist of the new debentures, 100,000 shares of 5 percent cumulative preferred stock, Series A, $25 par value, and 22,778 shares of $10 par value common stock. The company reported for the nine months ended on May 31 a net profit of $323,878. For the fiscal year to Aug. 31, 1945, the net profit was $342,918 and sales were $6,378,029.

Associated with Lee Higginson in the offering are Shields & Co., Shuman, Agnew & Co., Maynard H. Murch & Co., Piper, Jaffray & Hopwood; Harold E. Wood & Co., the Richard W. Clarke Corporation and Grubbs, Scott & Co.

New Eddy Stock Listed

TORONTO — Two hundred thousand cumulative convertible $20 par value preferred shares of Eddy Paper Company, Ltd., have been listed on Toronto stock exchange.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending August 24, 1946

STOCKS

	High	Low	Last
A. P. W.	7¾	7⅜	7⅜
Armstrong Cork Co.	57¾	55	55
Celotex Corp.	32	28⅝	30½
Celotex Corp., pf.	22¼	21¾	22
Certain-Teed Products Corp.	24¼	21¾	23⅛
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	59¼	57	58
Champion Paper & Fibre Co., pf.	112	112	112
Congoleum Nairn Co.	33	32¼	32¼
Container Corp. of America	46½	44	45
Continental-Diamond Fibre Co.	13¾	13	13¼
Crown-Zellerbach Co.	34⅛	32	33¼
Crown-Zellerbach Co., pf.	110	109	109
Dixie Cup Co.	45	42½	44¼
Dixie Cup Co.—A	57	56	56
Flintkote Co.	38⅜	36	37¼
Flintkote Co., pf.	113	112¾	112¾
Robert Gair	10⅛	9¾	9⅞
Robert Gair, pf.	20⅝	20½	20⅝
International Paper Co.	50¾	47	48¾
International Paper Co., pf.	113	108	109
Johns-Manville Corp.	141½	134¾	137½
Johns-Manville Corp., pf.	121¼	119½	121¼
Kimberly-Clark Corp.	30¾	30	30¼
Mac Andrews & Forbes	40	40	40
Mac Andrews & Forbes, pf.	....	....	....
Masonite Corp.	67	65¾	65¾
Mead Corp.	26¼	23¾	25⅛
Mead Corp., pf. 4½	....	....	....
Mead Corp., pf. 2	56	54½	55
National Container Corp.	34¼	31⅞	33¼
Paraffine Companies, Inc.	77⅜	74	74
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	26¾	24⅜	25
Rayonier, Inc., pf.	37¾	37½	37½
Ruberoid Co.	56	54¼	55
Scott Paper Co.	59½	57¾	57¾
Scott Paper Co., pf.	107½	106¾	107½
Sutherland Paper Co.	48½	46	47
Union Bag & Paper Corp.	37½	34	36½
United Paperboard Co.	13⅝	13⅛	13⅜
U. S. Gypsum Co.	123	120	120
U. S. Gypsum Co., pf.	202	202	202
West Virginia Pulp & Paper Co.	44¾	44	44½
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 3¾s '60	105½	105¼	105¼
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	105¼	105¼	105¼
International Paper Co. 5s '47	101⅜	101⅜	101⅜
Mead Corp. 3s '66	103½	103½	103½

New York Curb Exchange

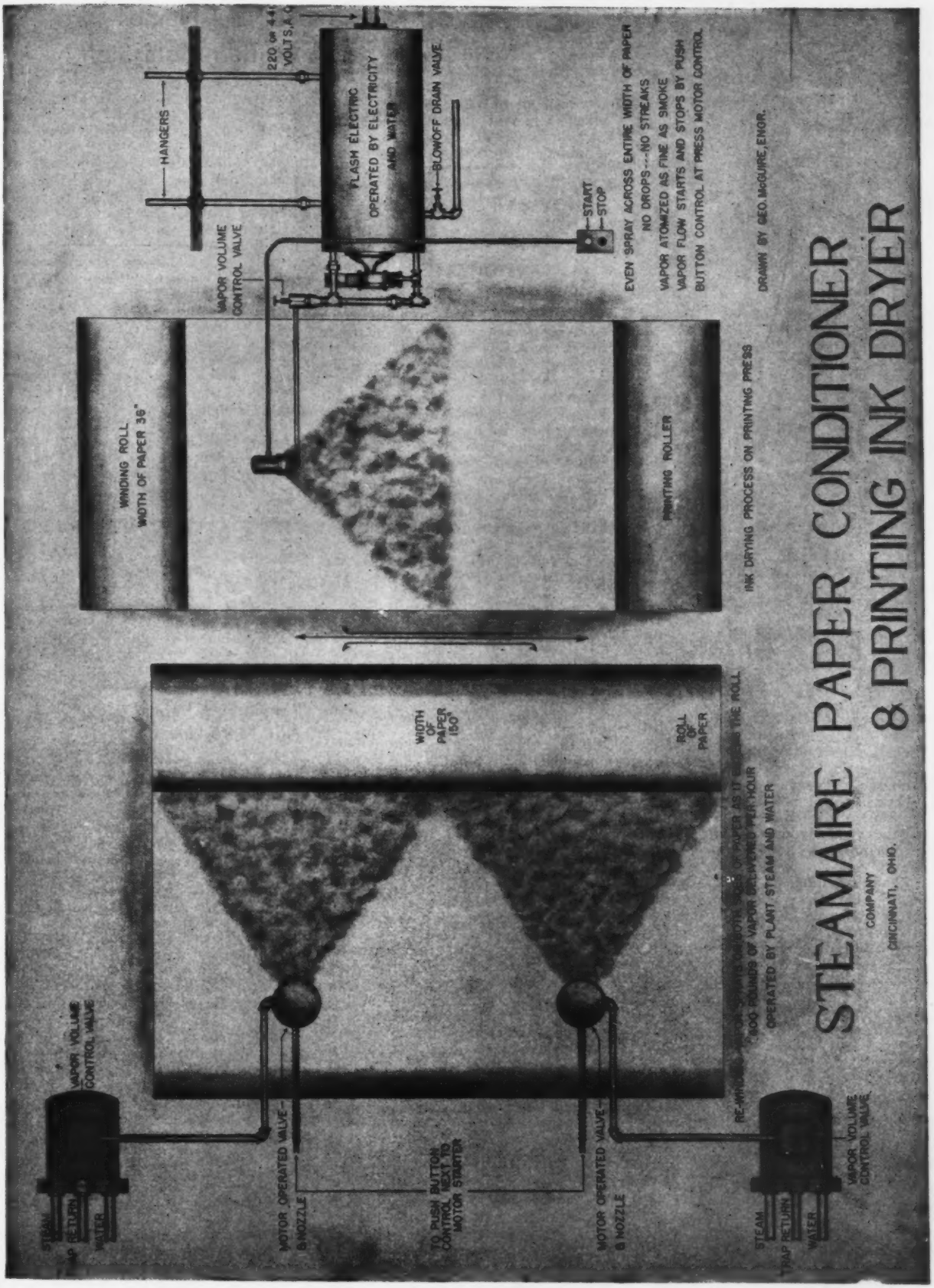
High, Low and Last for Week Ending August 24, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	45¾	44½	45¼
Hummel-Ross Fibre Corp.	15¾	14¼	15⅛
St. Regis Paper Co.	12⅞	12⅛	12⅜
Taggart Corp.	10	9½	10

BONDS

American Writing Paper Co. 6s '61	....	....	....


STEAMAIRE PAPER CONDITIONER
& PRINTING INK DRYER
COMPANY
CINCINNATI, OHIO.
DRAWN BY GEO. McGUIRE, ENGR.
INK DRYING PROCESS ON PRINTING PRESS
EVEN SPRAY ACROSS ENTIRE WIDTH OF PAPER
NO DROPS---NO STREAKS
VAPOR ATOMIZED AS FINE AS SMOKE
VAPOR FLOW STARTS AND STOPS BY PUSH
BUTTON CONTROL AT PRESS MOTOR CONTROL
FLASH ELECTRIC
OPERATED BY ELECTRICITY
AND WATER
HANGERS
220 or 44
VOLTS, A.C.
BLOWOFF DRAIN VALVE
START
STOP
VAPOR VOLUME
CONTROL VALVE
WINDING ROLL
WIDTH OF PAPER 36"
PRINTING ROLLER
WIDTH
OF
PAPER
150"
ROLL
OF
PAPER
MOTOR OPERATED VALVE
& NOZZLE
TO PUSH BUTTON
CONTROL NEXT TO
MOTOR STARTER
OPERATED BY PLANT STEAM AND WATER
STEAM
TRAP RETURN
WATER
VAPOR VOLUME
CONTROL VALVE

SAPEYES Golf At Bob-O-Link

CHICAGO—Fifty-seven golfers, and eight added "starters" who enjoyed the dinner festivities without the golf, participated in the second golf outing of the summer sponsored by the western division of the Salesmens Association of the Paper Industry held at the Bob-O-Link Golf Club on Tuesday, August 20. The event, held under the direction of J. C. Keeney of Kimberly-Clark Corporation, golf chairman, was unusually successful even though the mid-week date departed somewhat from the "Friday" selection which is the usual day for the SAPEYES.

Low gross winner was Gene Hammes, Reliable Paper Company with Courtney Reeves, Allied Paper Company, taking second low gross honors. In the list of those winning low net honors were John Stobbe, Blundon-Lyon Paper Company, F. Wittleder, Chicago Paper Company, Joe Cowhill and Hod Heath of Allied Paper Company. Other prize winners announced by Mr. Keeney were Ken Lamong, Bradner, Smith & Company; H. Phillips, Midwest Gummed Paper Company; R. A. Freeman and B. Stine, guests. Lou Bilz, Chemical Paper Company, won high gross honors with a reported total of strokes around the 130 mark. Foursome winners also were listed.

Mr. Keeney reported that a third outing was to be held on September 27 when the group will play a return engagement at the Park Ridge Country Club, site of the June outing.

George P. Gaw, Director of the Color Research Institute of America, is to be the speaker at the big "kick-off" meeting which will be held on Monday, September 9 at the Hotel Sherman to formally start the western division of he Salesmens Association of the Paper Industry on its fall and winter program. Announcement of Mr. Gaw's coming appearance was hailed with satisfaction by those who had heard him before and a large crowd is expected to hear one of the outstanding experts in his line in the country. The SAPEYES will hold no meeting on September 2, Labor Day.

At a recent Monday noon luncheon the Association welcomed back one of its popular members, Ed Rolain of the Mosinee Paper Mills, who returns to his work and his many Chicago friends after forty-four months of service with the Marine Corps.

Stationers Plan to Hold Fortieth Convention

CHICAGO—The National Stationers Association will hold its fortieth annual convention and tenth annual exhibit on September 30 and October 1, 2 and 3 at the Palmer House. Advance information indicates that a total of twenty-eight hours has been provided, aside from the outstanding speaking program, to permit careful inspection of all exhibits. The exhibits, as usual, will be staged by a large number of firms either directly with or allied to the paper trade and the stationery supply field. They will be in the Exhibition Hall of the Palmer House, grouped together to permit intelligent and careful inspection of displays with a minimum of time.

Lakeview Switches To Creped Wadding

NEENAH, Wis.—Paper making operations are being brought to a close at Kimberly-Clark Corporation's Lakeview mill, as the No. 2 specialty paper machine is dismantled to make room for the new creped wadding machine.

Operation of the No. 2 machine has been continuous since 1929 when the Lakeview mill was purchased from Sears, Roebuck and Company, which was making its own catalogue stock. At that time Lakeview consisted of a building sheltering two paper machines. The mill employed 150 persons. The No. 1 machine was removed five years later, and No. 1 and No. 3 creped wadding machines were added, but No. 2 stayed on as a specialty machine.

Paper at that time was known by the trade names of Bristol, Kimray, and cover stock. The former was made in eight colors, and the latter two in about 100 various shades.

During the war No. 2 was utilized on a number of jobs, including a portion of the corporation's mimeograph business.

The addition to the mill is progressing rapidly as the exterior brick walls to match the other part of the building and the interior glazed brick walls move toward completion.

Booklet Describes An-cor-lox Nuts

GLENBROOK, Conn. — A comprehensive folder of An-cor-lox Lock Nuts has just been issued by the manufacturers, An-cor-lox Division, Laminated Shim Company Incorporated. This new lock nut—which, in its several years of field tests and introductory use, has won approvals from hundreds of large industrial corporations—is fully described in the folder. It is replete with diagrammatic, photographic and factual matter on An-cor-lox styles, materials, designs and finishes; application instructions; and suggestions for parts conversion to the An-cor-lox function.

Pace Joins Airlines

CHICAGO — Sam Pace, formerly Strathmore Paper Company western representative, and late of the Army, soon reports to American Airlines at Dallas, Texas, as Regional Public Relations Director of the Southern Region.

Hurlbut Names Two To Ben Mont Staff

BENNINGTON, Vt. — D. C. Hurlbut, president of Ben Mont Papers, Inc., has appointed Robert B. Brown and Dr. Clarence E. Irion to the company administration staff. Both men are widely known throughout the papermaking and converting industries and have been associated with organizations of national importance.

Brown has been chosen, after months of making tests of various applicants, as the industrial engineer best equipped to cooperate in the company's post-war program. His successful experience has been endorsed for many years by both management and labor. Brown conducted a private engineering service before coming to Ben Mont and previously was connected with Ford, Bacon & Davis, New York.

Dr. Irion is a well known research chemist on problems of paper and printing and has a most exceptional record of creative triumph. He was formerly director of research for the J. M. Huber Company, New York, manufacturers of newspaper inks and has made a wide investigation for some of the largest newspapers and magazine printers for the improvement of paper, printing and inks. He will bring to Ben Mont the latest methods and many new formulas for the manufacture of special inks. Dr. Irion has already assumed his duties as chemist in charge of research, development and control.

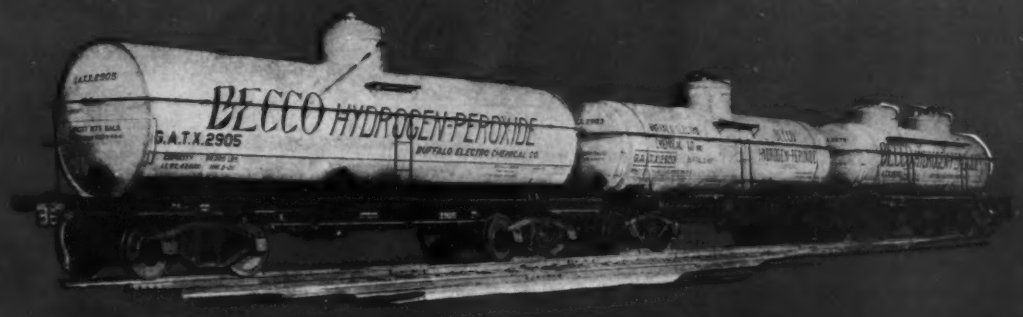
Ronnie Firm Would Add More Lines

NEW YORK — Ronnie, Inc., with headquarters at 40 Wall Street, and personnel of twenty-six specialists in numerous commodities, is in the process of establishing sales representatives throughout the United States and seeks to take on a few additional accounts on a long-range basis. The firm is experienced in the conversion of paper and presently specializes in the sale of paper and paper products on a domestic, as well as on a foreign basis. The Paper Department is under the supervision of J. L. Eskridge who has had many years experience in both the manufacturing and merchandising divisions of the paper industry.

The Dominion Government of Canada has authorized the establishment of a branch office in Montreal, which is now in the process of completion, and the volume of business from this area should not be overlooked.

Vedder Resigns from Rice Barton

WORCESTER, Mass.—J. Warren Vedder, vice-president of the Rice Barton Corporation, manufacturers of paper mill machinery, has resigned. Vedder will remain as a director but has severed all active connections with the company.



A Few Important Facts About

BECCO HYDROGEN PEROXIDE

for

GROUNDWOOD BLEACHING

1. Hydrogen peroxide is a water-white liquid.
2. Easy and safe to handle.
3. Shipped in drums or tank cars.
4. Can be stored in tanks and pumped directly to point of use.
5. Actual feeding of peroxide is automatic and fully controlled. It can be measured and metered as easily as water.
6. It can be diluted with water in any desired proportions.
7. Reduces overall bleaching costs.
8. Can be used for bleaching at any desired pH.

Because of its high stability, ease of handling and simplicity of application, hydrogen peroxide has become the most important bleaching agent in the huge textile industry.

Avail yourself of Becco's wide experience in bleaching with hydrogen peroxide; of Becco's extensive research data for bleaching groundwood pulp. Learn about Becco's system of feeding chemicals automatically. Now is the time to investigate the use of Becco Hydrogen Peroxide for groundwood bleaching. Write to:

BECCO

BECCO SALES CORPORATION

AGENTS FOR BUFFALO ELECTRO-CHEMICAL CO., INC.

18 Sawyer Avenue, Buffalo 7, N. Y.

New York Boston Philadelphia Chicago Charlotte

Package Machinery Outlines Its Financing Proposals

SPRINGFIELD, Mass. — A three-point program has been proposed by directors of the Package Machinery Company to finance the purchase price of $1,750,000 for the Pratt and Whitney plant in East Longmeadow, together with $250,000 for rearrangement of its facilities and moving equipment and an additional $250,000 for new equipment. This makes a grand total of $2,250,000. The plan was outlined in a letter to stockholders in which they were notified of a special meeting to be held September 4 to consider and vote on the proposed method of payment. The huge cash payment for the initial cost of the Pratt and Whitney plant must be handed to the War Assets Administration on delivery.

The plan includes first to issue 10-year serial notes for $1,000,000; second to issue $1,250,000 of 4 percent preferred stock; third, to issue additional common stock to raise $280,000.

President George A. Mohlman in a letter to all employes stated clearly that the money for this tremendous expansion must be borrowed since the company has no adequate surplus for such a purpose.

Mohlman explained that the company has a tremendous backlog of orders some going as far back as 1941.

THE chart above, made at the plant of a large paper manufacturer, is positive proof of the constant, uniform delivery of Warren Machine and Jordan Chest Centrifugal Pumps. It shows a 24-hour record of stock level in the regulating box... head in chest varied from 0 to 8 feet, yet practically throughout the entire test, the Warren Machine Chest Pump maintained the regulating box level *constant to a fraction of an inch!*

A Warren Centrifugal Chest Pump gives you these advantages over a plunger-type pump: smooth flow without pulsation; discharge valve can be closed and not build up excessive pressure on pump and discharge line; takes up less floor space and much less head room; no pockets to hold old stock; a diagonally split case makes it unnecessary to remove discharge piping—rotating member can be easily lifted out; no noisy gears to create vibration.

The maintenance charges of a Warren Centrifugal Chest Pump are low as compared with a plunger pump. Renewable liners prevent wear on suction heads—there are no plungers to be turned or replaced. *And in addition,* the *initial cost of a Warren Centrifugal Chest Pump is lower than that of a plunger pump of much smaller capacity.*

A Warren Centrifugal Machine or Jordan Chest type pump . . . in operation in *your* plant . . . will assure uniform delivery under varying conditions of suction, submergence and density of stock. Write for complete information and list of installations.

Warren Pumps

CENTRIFUGAL AND RECIPROCATING PP-4½

Warren Steam Pump Company, Inc., Warren, Massachusetts

Pulp and Paper Bulletin Extends Its Scope

News items of interest to publishers, printers and other users of paper will be more prominently featured in the forthcoming issues of the PULP & PAPER BULLETIN, monthly house organ of Bulkley, Dunton. In the past three years or so the bulletin has been published by the Bulkley, Dunton Pulp Company, but the growing interest shown in this publication by the graphic arts trade has induced the organization to extend its scope, and future issues will be sponsored by the three affiliated companies, Bulkley, Dunton & Co., Inc., Bulkley, Dunton Pulp Co., and Bulkley, Dunton Paper Co., S.A., all of 295 Madison Avenue, New York, N. Y.

The Bulletin owes its popularity to the brief and concise manner in which it presents important trade news and directs the attention of its readers to some items of particular interest published in the trade press. Another of its popular features is the series of articles on pulp and paper mills, industry personalities and descriptions of institutions, associations and other instrumentalities which serve the interests of the manufacturers and consumers of pulp and paper.

Robertson Staff Turns Out For a Day at the Shore

MONTVILLE, Conn. — More than 400 persons including employees and members of their families attended the 11th Summer Outing of the Robertson Paper Box Company held at Ocean Beach Park on Saturday, August 17th. A softball game between the Box Factory and the Board Mill proved to be a lively affair with the Board Mill taking a close decision. Following the ball game races and variety games conducted by George Garvey and his assistants attracted a large number of contestants. Following is a list of the winners of the various athletic events:

Children: 25 yd. dash — Joan Deshefy; Crawl Race—Philip Overbaugh; Potato Race — (grades 2-3-4) Philip Overbaugh; Potato Race (Older Group)—David Glassman.

Women: 50 yd. dash—Mary Angeloszek; Crawl Race—Emma Carpenter; Potato Race—Rose Kotula.

Men: 50 yd. dash—James Sarayusa, Jr.; Football Throw—James Sarayusa, Jr.; Basketball Throw—Harold Thomann; Broad Jump—Carmelo Morales.

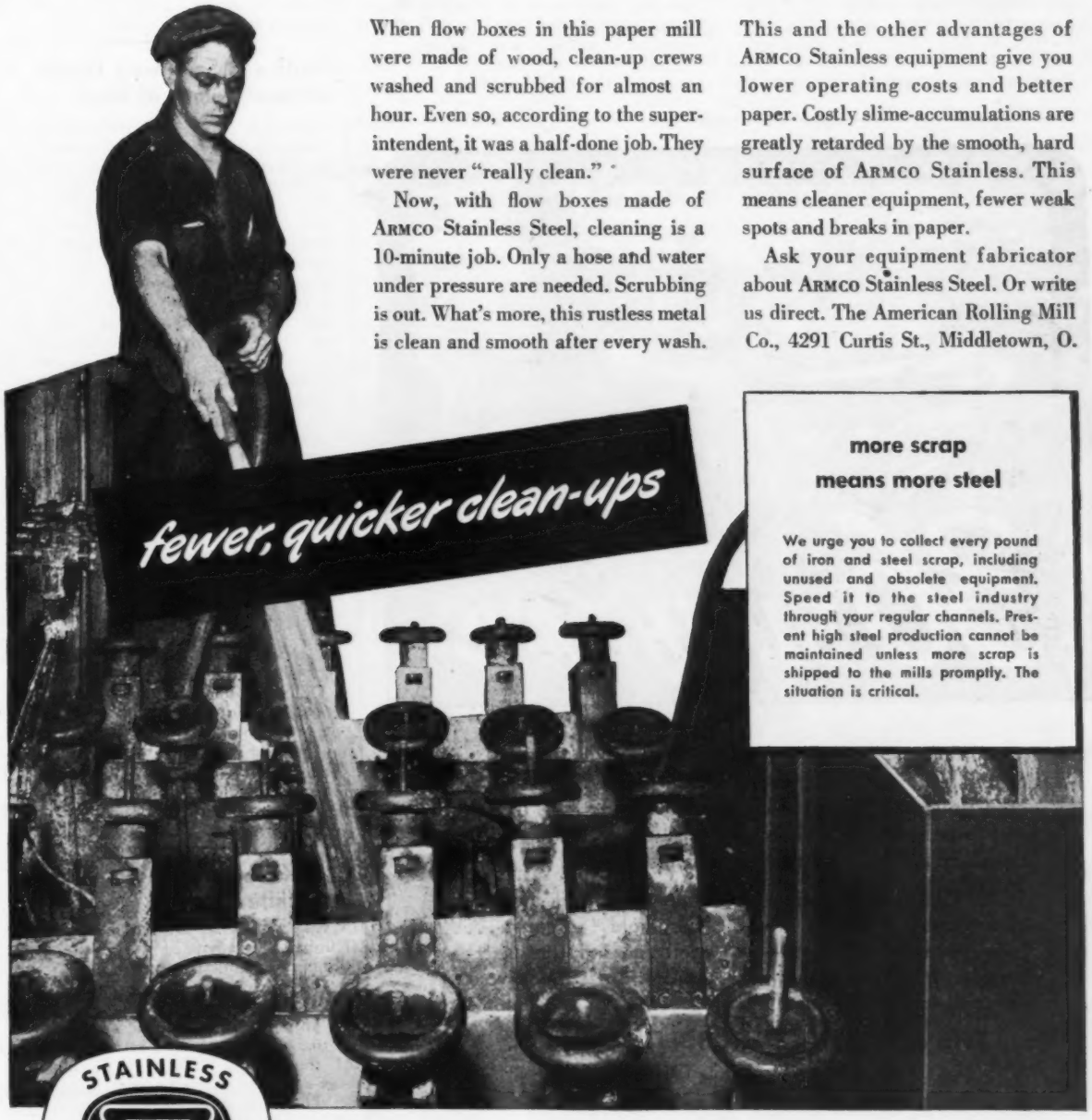
Tug-o-War — *Women:* Married Women's Team; *Men:* Board Mill Team.

Prizes including Major League Baseballs, kerchiefs, nylons, and cigarettes were awarded to the winners.

A steak dinner was served in the beach auditorium at 1:15 P.M. President Ralph A. Powers extended a cordial welcome to the employees and their families. A musical program featuring the Crocker House Ensemble with vocals by Hub Neilan was conducted during the dinner period.

ONE OF THE "BIG 7" ADVANTAGES

OF STAINLESS EQUIPMENT



When flow boxes in this paper mill were made of wood, clean-up crews washed and scrubbed for almost an hour. Even so, according to the superintendent, it was a half-done job. They were never "really clean."

Now, with flow boxes made of ARMCO Stainless Steel, cleaning is a 10-minute job. Only a hose and water under pressure are needed. Scrubbing is out. What's more, this rustless metal is clean and smooth after every wash.

This and the other advantages of ARMCO Stainless equipment give you lower operating costs and better paper. Costly slime-accumulations are greatly retarded by the smooth, hard surface of ARMCO Stainless. This means cleaner equipment, fewer weak spots and breaks in paper.

Ask your equipment fabricator about ARMCO Stainless Steel. Or write us direct. The American Rolling Mill Co., 4291 Curtis St., Middletown, O.

more scrap
means more steel

We urge you to collect every pound of iron and steel scrap, including unused and obsolete equipment. Speed it to the steel industry through your regular channels. Present high steel production cannot be maintained unless more scrap is shipped to the mills promptly. The situation is critical.

STAINLESS ARMCO STEEL

THE AMERICAN ROLLING MILL COMPANY

Special-Purpose Sheet Steels • Stainless Steel Sheets, Bars and Wire

Smith Work Resumed After Negotiation

LEE, Mass.—The unauthorized work stoppage at Smith Paper, Inc., ended last Thursday. Members of the International Brotherhood of Papermakers, local 78, met in Memorial hall and agreed to return to work.

Negotiations were entered into by Walter F. Tatum, vice-president and general manager of the company, and the negotiating committee of the union consisting of Thomas McGinty, John and Hubert Tormey, Edward Herlihy, James Clifford, John Ford, Mrs. Mary Carty and F. J. Rochford, representative of International Brotherhood of Papermakers, Westfield, through the efforts of United States Commissioner of Conciliation Robert E. Cosgrove.

The work stoppage first occured the Saturday previous in the winding and gumming departments of the Columbia mill due to an alleged violation of the contract by the company.

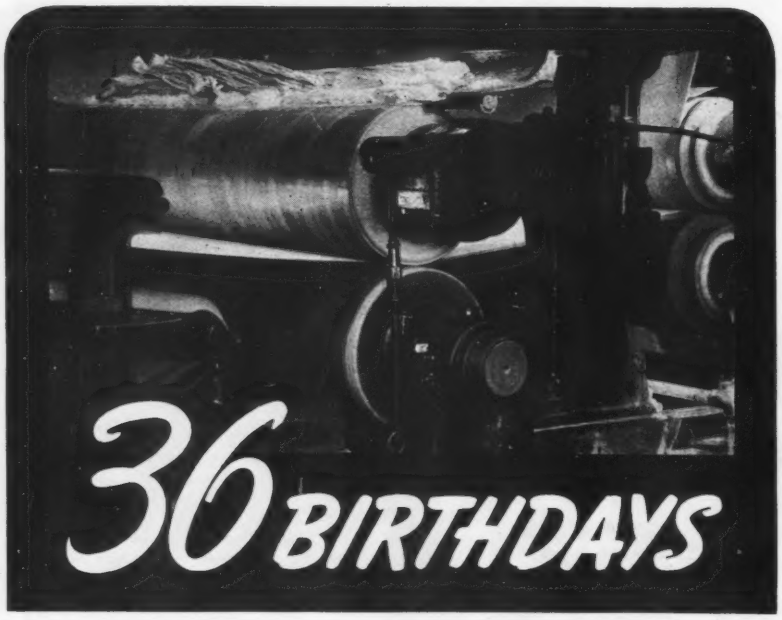
The company alleged contract violation on the part of the employes and after complete stoppage of work at all mills Monday, the federal conciliator was called in.

It was found in the discussions during negotiations that several misunderstandings had occurred and after thorough studies of these points an amicable settlement was reached.

Frederick J. Rochford of Westfield, agent for the union, said at a meeting that the walkout was not sanctioned by the union. He said the strike developed when a negotiating committee could not settle grievances between the workers and the company.

Rochford said the strike started after gummers refused to operate two machines instead of one as previously. The order for the double operation followed a 13-cent an hour pay raise announced by the company several days ago.

The wildcat strike had closed all four of the company's plants. Negotiations between the workers and the management began immediately.



Since 1910... for 36 years... Cincinnati Rubber Covered Rolls have been serving the paper industry. During that time they have achieved a position of leadership in the world's most important paper mills.

Today Cincinnati Rubber Covers are preferred because of the unusual manner in which they hold the crown... because of steady trouble-free operation and the exacting way in which they meet specifications. Send your next roll to CINCINNATI for recovering.

THE CINCINNATI RUBBER MFG. CO.
Cincinnati 12, Ohio

CINCINNATI RUBBER COVERED ROLLS

South and Southwest Trades To Meet Jointly at Biloxi

BILOXI, Miss.—The meeting of the Southern Paper Trade Association at the Buena Vista Hotel, September 20-21, 1946, has been broadened to make it a joint meeting of the Southern and Southwestern Associations. A large attendance is expected of the paper merchants of the South as well as mill representatives and paper merchant prospects who are not now members of either association. All these are invited to attend the Biloxi meeting, as well as representatives of the paper press, where they will be registered in the manner usually followed at such meetings.

Except for a separate executive meeting of each association on the morning of September 21st, all the proceedings will be participated in jointly by the two associations and their mill and merchant guests, with some special provisions for the ladies. The Buena Vista is one of the large Gulf Coast resort hotels, about half way between Mobile and New Orleans on the Louisville and Nashville R. R., and is well equipped to handle all who may want to attend the meeting.

Officials of the two associations will meet in New Orleans on August 31st to perfect final plans for entertainment and procedure. These associations embrace paper merchants of the states of Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, and Texas.

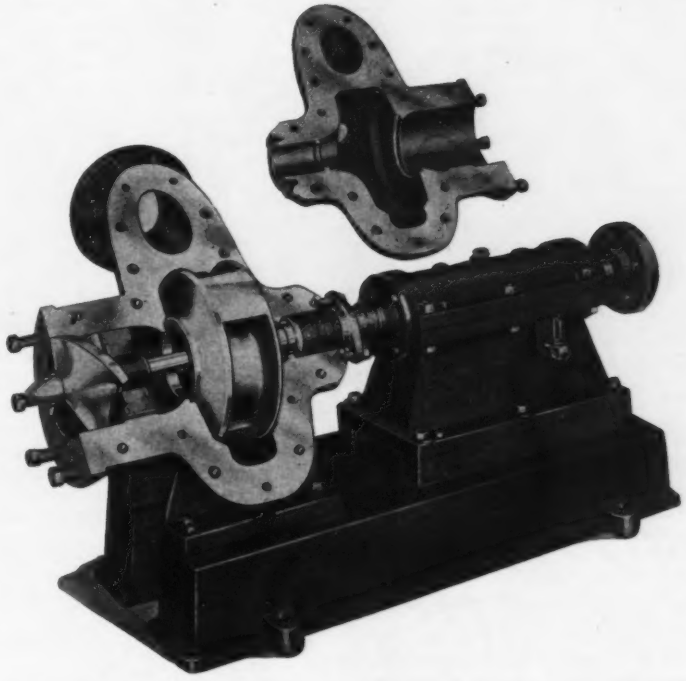
J. P. Kimball Retires At White River

WHITE RIVER JUNCTION, Vt.—J. P. Kimball, president of the White River Paper Co. and associated with it for 54 years, has retired. As a youth he entered the employ of Samuel Farman, the founder of the business, which was at that time conducted in the basement of the Smith building. The business was removed to its present location in 1910. After four years employment with Farman, Kimball became a member of the firm and later was made treasurer. A few years prior to Farman's death he assumed the management and continued in that capacity until the death of his partner, George G. Nichols in 1943, since when he has been president.

SOLID SHELL RUGGEDNESS with SPLIT SHELL ACCESSIBILITY

The Buffalo "DS" stock pump has every feature demanded by mill operators. First, it's rugged to the point of being almost indestructible. Heavy casing, heavy shaft, oversize bearings and coupling, amply-proportioned bearing stand, large base—all parts of this pump are oversize in relation to the service.

Once in operation, the "DS" offers advantages which the operating engineer recognizes at a glance. The rotor may be inspected without disturbing suction or discharge piping by removing a few bolts from the upper pump casing. By removal of a few more bolts from the bearing halves, the entire pump can be dismantled when necessary, to change rotors or make other replacements.



And from an efficiency standpoint, "DS" pumps have an excellent record on high consistency stock, for dumping beaters, feeding Jordans, for head box service, and handling "gassy" stocks. Full details in Bulletin 953-F. Write for a copy.

BUFFALO PUMPS, INC.

159 Mortimer Street **Buffalo, N. Y.**

Canadian Pumps, Ltd., Kitchener, Ont.

"Buffalo" **TYPE "DS" PAPER STOCK PUMPS**

Polytechnic Offers Pulp Course Again

BROOKLYN, N. Y.—In view of the success of the graduate course on Pulp and Paper Technology given last year at the Polytechnic Institute, the course will again be offered during the forthcoming academic year 1946-47. Important processes and methods which are used in the production of pulp and paper will be described and calculations of equipment and processes made. Bleaching and further preparations of pulp and the making of paper will also be studied, as well as the testing of paper and paper materials. All types of pulp and paper products, from tissue paper and high alpha cellulose pulp to roofing papers, wallboard, and insulating materials will be discussed, as well as the processes for de-fibering and de-inking of waste papers.

The course is under the direction of Robert S. Aries, Consulting Engineer, and Director of the Northeastern Wood Utilization Council, assisted by a group of industry lecturers. They include R. G. Macdonald of The Technical Association of The Pulp and Paper Industry; V. P. Edwardes of The International Paper Company, Arthur Pollack of The West Virginia Pulp and Paper Company, T. Malcolmson of The Robert Gair Company, C. E. Libby of The New York State College of Forestry; R. M. Cobb of the Lowe Paper Company, Allan Schenck of The Riegel Paper Company, etc.

The course will embrace 30 lectures given on Thursday evenings from 6 to 8 P.M. It will be open to qualified men from industry.

Newsprint Inventories Average 37 Days

CHICAGO—Local newspaper association offices reported an average of 37 days supply of newsprint in the country at the end of July, an increase of seven days supply compared with stocks on hand at the end of June. The American Newspaper Publishers Association said this compared with supplies for 54 days at the same time a year ago, 66 days as of two years ago, 64 days three years ago and 52 days five years ago. The first seven months of 1946 the newspapers used 1,734,883 tons of newsprint, an increase of 29.4 per cent from the first seven months of 1945 and of 3.1 per cent from the first seven months of 1941.

K-C Women Stage Golf Party

NEENAH, Wis.—Thirty-four women employes of Kimberly-Clark attended the annual women's outing of the firm Sunday, August 18, at Ridgeway Golf Club. Betty Rogers and Mary Collar shared honors for low golfing scores while winners of a prize for the high score were Leone Quinn and Arlene Ohm.

OBITUARY

Ralph McAdam Jones

UTICA, N. Y.—Ralph McAdam Jones, nationally known textile authority, died unexpectedly last Friday, in Berwick, Pa. He had been on a business trip to Washington and was motoring back to Utica, accompanied by Mrs. Jones. Death was due to a heart attack while the group was at breakfast in the Berwick Hotel.

Mr. Jones was born in Utica July 19, 1886, a son of the late Albert G. and Julia Wykoff Jones. He was educated in Utica schools and was graduated as an honor student from Utica Free Academy in 1904.

Mr. Jones was president of the Utica Duxbak Corporation, of the Mutual Boxboard Company.

John Joseph Pound

DEXTER, N. Y.—John Joseph Pound, 69, former mill superintendent of the Dexter Sulphite, Pulp and Paper Company, died at his home here after an illness of three years. He retired in 1943. He started as a steamfitter for the company many years ago and rose to become mill superintendent.

He was a trustee of the Dexter Presbyterian Church and for several years served on the Dexter school board and was a member of the Dexter Cemetery Association. His wife, a son and a daughter survive.

Kimberly-Clark Gives Fellowship Grants

NEENAH, Wis. — Kimberly-Clark Corporation has announced fellowships, with grants offered to the University of Wisconsin, the University of Minnesota and to the Massachusetts Institute of Technology by the technical department of the corporation.

It is expected that the Kimberly-Clark fellowships will be arranged in time for the 1946-47 terms, to be coincident with the opening of the new Kimberly-Clark Research and Development Laboratories on which work has been in progress since last September.

"The fellowships represent a policy-conception we have that Kimberly-Clark should spend more of its research budget in fundamental background work," H. A. Rothchild, technical director, said, "and we expect to accomplish this in part through sponsorship of research fellowships. The field of study has been specified only to the extent that the subject shall be of interest and value to the pulp and paper industry."

The new Kimberly-Clark laboratories are reaching completion and will provide centralized facilities for 170 scientists and additional research and development personnel. Generally, it is expected to represent the most extensive commercial technical laboratory in the pulp and paper industry.

Lawson Lines Up Southern Sales Outlet

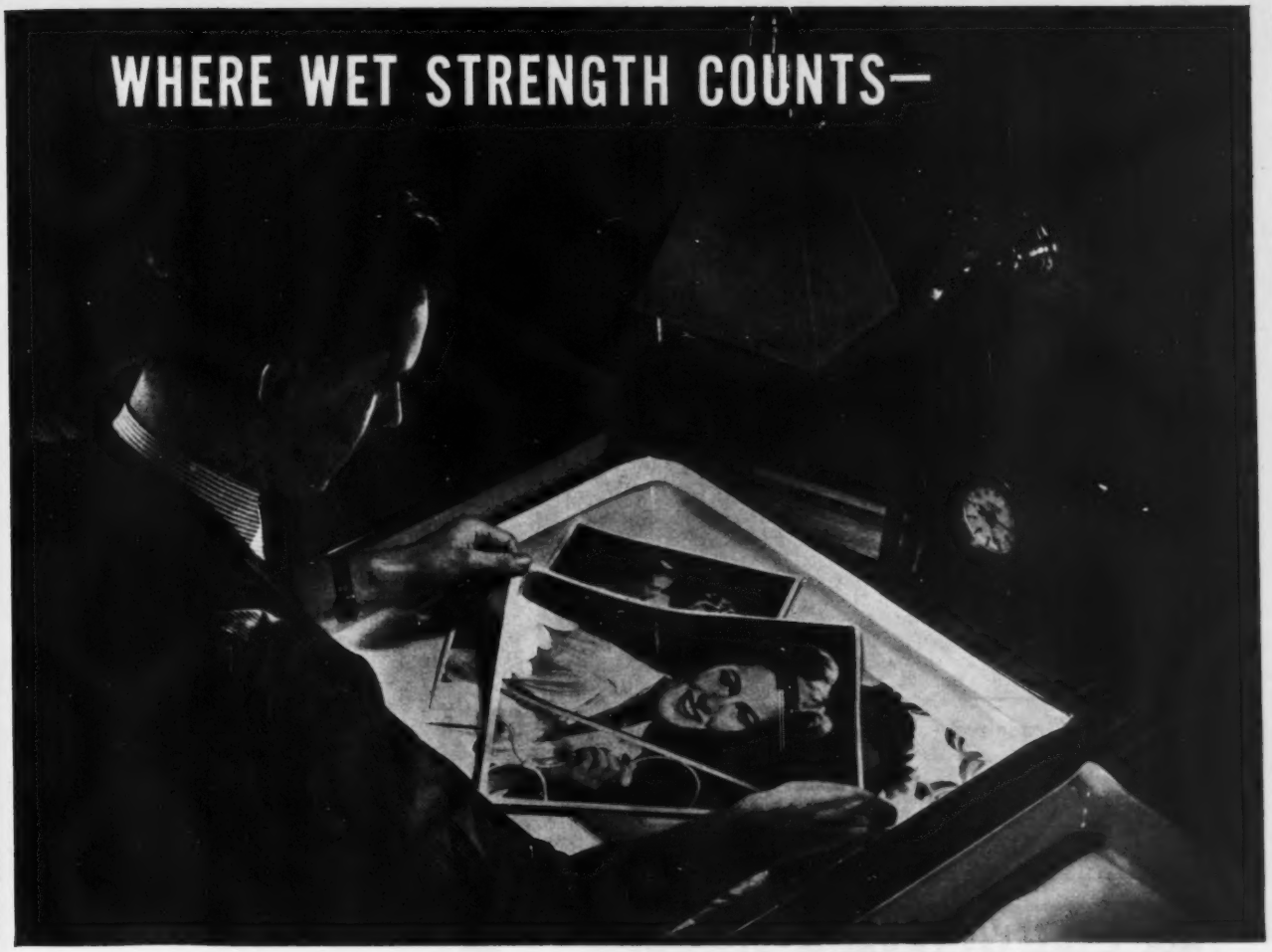
ATLANTA — Southeastern Printers Supply Co., printing machinery dealers has completed an exclusive selling agreement with the E. P. Lawson Company, Inc., of New York. Lawson manufactures the New Lawson Automatic Clamp Paper Cutter, including the Lawson "38" and Automatic Spacers; also the Lawson Multiple Head Drill-Slotter, and Multiple Head Round Hole Drilling Machine. Installations and service will be maintained by Southeastern in North Carolina, South Carolina, Georgia, Mississippi, Florida and Tennessee.

ENGINEER AVAILABLE

CIVIL ENGINEER — During 17 years manager of a large paper mill making fine papers in Europe, seeks situation as manager or chief engineer in a paper mill in the United States or Canada. Address Box 46-596 care Paper Trade Journal.

INGENIEUR CIVIL—Pendant 17 ans Directeur d'une grande Papeterie de Papiers fins en Europe cherche situation Directeur ou Ingenieur Chef dans une Papeterie aux Etats Unis ou Canada. Address Box 46-596 care Paper Trade Journal. A-29

WHERE WET STRENGTH COUNTS—



—count on UFORMITES 467 and 470!

Photographic, photostat and other sensitized papers are but a few of the many applications in which wet strength is of the utmost importance . . . in which you can use the UFORMITES efficiently and economically.

UFORMITE 467 is particularly designed for use with Kraft by beater addition in the production of bag and wrapping paper, food wrapping, towelling, blue print and map paper. UFORMITE 470 is recommended for sulfite, rag and ground wood stocks for such papers as high wet strength glassine, light weight absorbent tissues, sulfite wrapping paper, chart and ledger papers.

Neither UFORMITE 467 nor UFORMITE 470 affect the color, odor or taste of paper. No special equipment is required to prepare the resin. No special handling is necessary. As little as 1% resin on dry fibre weight will increase wet strength as much as 30%.

But that's not all. Other advantages of using the UFORMITES are improved dry tensile and Mullen, fold, uniformity of sizing, and coating surface characteristics.

To make the value of your paper production *higher* — the cost, *lower* — investigate the use of these wet strength resins today.

UFORMITE *is a trade-mark, Reg. U.S. Pat. Off.*

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Downingtown to Equip New Gypsum Mills

Agreements have been signed by the Downingtown Manufacturing Company of Downingtown, Pennsylvania and the United States Gypsum Company of Chicago, Illinois, which provide that the Downingtown Manufacturing Company will build for the United States Gypsum Company two large combination paper machines and furnish all of the stock preparation equipment, for two combination felt and paper mills.

The engineering department of the United States Gypsum Company made an exhaustive study of the most economical methods of producing papers and felts. The results of this study were embodied in a complete engineering report including proposed mill designs and anticipated production costs.

It was decided to build one mill on the Pacific coast and one mill on the East coast. The stock preparation system design and layout is being made by Polleys and Baxter, consulting engineers of Middletown, Ohio.

Combustion Organizes Mexican Subsidiary

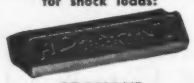
NEW YORK — Combustion Engineering Company, Inc., 200 Madison Avenue, has formed a new company to meet the needs of Mexican expansion programs in the public utility, manufacturing and mining industries for additional steam generating facilities. The new company, Combustion Engineering de Mexico, S. A. is located at Lopex 1, Mexico, D. F., and is organized to provide sales, technical and installation services in connection with Combustion's full line of boilers, fuel burning and related equipment. Resident executives of the new company are George C. Siefert, vice-president and general manager, and Seldon Merrill, manager of installation and service, both of whom have long been identified with the parent organization.

Lift Truck Surveys Offered by Towmotor

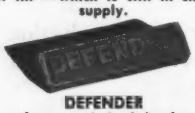
CLEVELAND — Offered as an aid to manufacturers with materials handling problems are the illustrated Lift Truck Job Studies published by Towmotor Corporation, 1226 E. 152nd St. These studies report in detail the methods used by many leading manufacturers to speed up the materials handling system with corresponding increases in efficiency and labor-saving economy. Newest in the series is one covering the materials handling methods used by The Cleveland Graphite Bronze Company, largest producer of lined bearings and bushings for automotive and aviation engines. It is available on request to Towmotor Corporation, Cleveland, Ohio.

TREATMENT FOR SHOCK LOADS

MAGNOLIA
makes two bearing metals for shock loads:



ADAMANT
for extreme conditions and where the application justifies the use of tin — which is still in short supply.



DEFENDER
for normal shock loads.

HOW often in the last six months have you had to repour a bearing that had cracked under shock loads? What was the cause? Was the bearing metal properly selected for the particular operating conditions?

When next you have to repour such a bearing, it will pay you to have a supply of ADAMANT or DEFENDER Bearing Metal on hand. Both are specially compounded to provide lasting service under repeated and severe shock loads. The combination of malleability, strength and toughness inherent in both these metals enables them to withstand hammer-blow stresses without cracking or chipping.

Send for your FREE copy of the MAGNOLIA Bearing Metals bulletin. It contains valuable refresher information on the technique of pouring bearings as well as scores of application recommendations.

Look for the Flower Brand

REG. U.S. PAT. OFF.

MAGNOLIA METAL COMPANY
18 WEST JERSEY ST., ELIZABETH 4, N. J.

MAGNOLIA BEARING METALS

Two Suits Filed Against Norwood

SPRINGFIELD, Mass.—Two additional bills in equity have been filed in superior court against the Norwood Engineering company. One was brought by the Bagley and Sewall company of Watertown, N. Y., by its counsel, Atty. Luke F. Ryan of this city, and the second by the Westinghouse Electric company of Boston. No returnable date has been set for the former bill but the latter was set for Aug. 21 in Boston.

The bill brought by the Bagley and Sewall company names James M. Smith and the Norwood Engineering company as defendants. Smith is the assignee to whom the property was transferred under an assignment for the benefit of creditors. The action seeks to prevent the transfer or sale of any of the property of the Norwood company and the return to the property of that portion of it assigned to Smith.

The plaintiff asks the court to ascertain how much money the Norwood Engineering company owes it, to declare null and void the transactions under which Smith received part of the Norwood property, that the property which has already been transferred to Smith by the company be applied for the satisfaction of Sewall and Bagley's claim against Norwood and that the portion still retained by Aaron and Edward Krock of Worcester, ostensible owners of the company, also be applied to satisfy the plaintiff's claim.

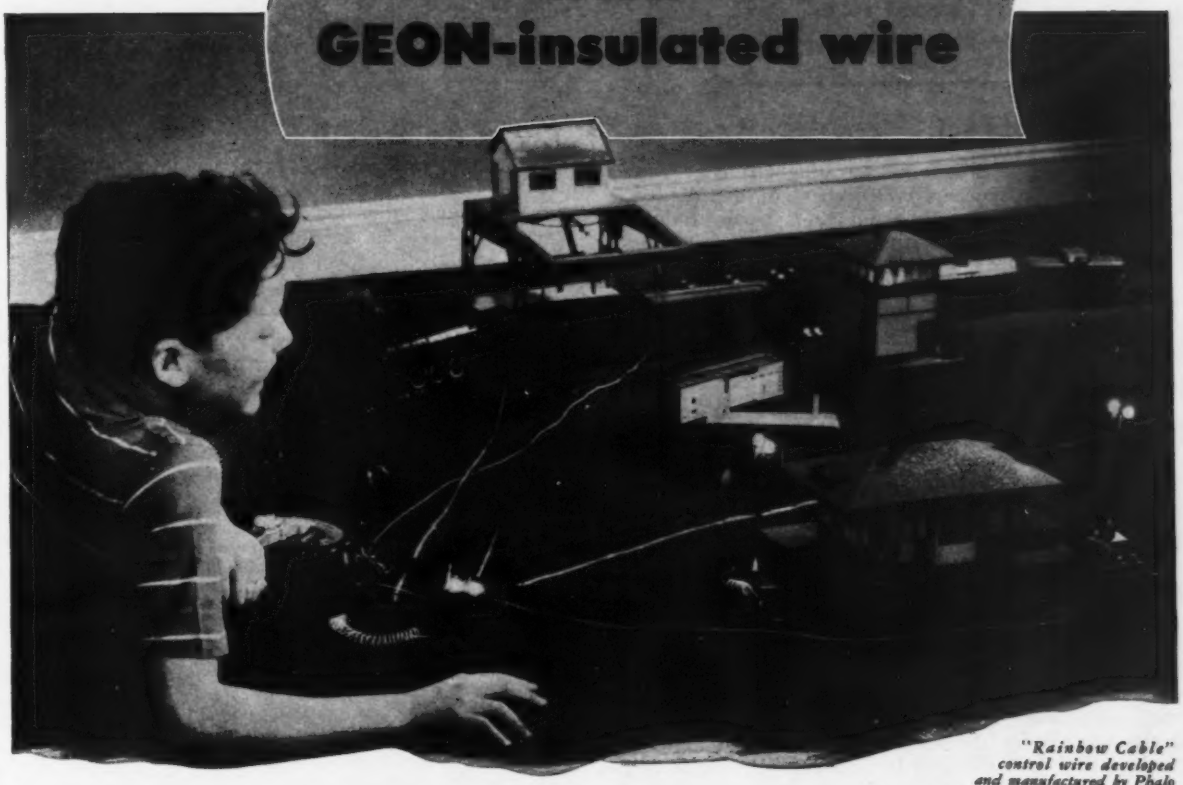
The bill also asks that Smith and the Krock brothers be ordered to account for the value of the company at the present time, and that a restraining order and a temporary injunction be issued to prevent the Krocks and Smith and all their agents or attorneys from transferring or selling any of the Norwood property.

The bill is said to be substantially the same as that brought by the Westinghouse company. Each adds to a growing entanglement of litigation in which the Norwood company and the Krock brothers are now involved. The suits against the company are already in excess of $150,000.

Lees Named Head Of Plant on Coast

LOS ANGELES—Robert A. Lees has been named manager of the American Anode, Incorporated, plant expected to be in operation late this fall. The plant will manufacture latex compounds and mixes for all purposes, for sale in the area west of the Rocky Mountains. It will be the only plant of its kind in the Pacific Coast area. All synthetic latices and natural rubber latex will be available in the plant, and compounds for all purposes, including dipped goods, metal coatings, paper and textile treatments and adhesives will be manufactured there.

He runs his road with GEON-insulated wire



"Rainbow Cable" control wire developed and manufactured by Phalo Plastics Corp., Worcester, Mass.

Another interesting application for GEON *raw materials*

THE things that Bill used to do with his hands to keep his railroad running—coupling and uncoupling cars, loading and unloading, turning switches—are all done by electricity on the modern American Flyer that huffs and puffs and belches smoke just like its full-sized counterpart.

That calls for connecting wires that are easy to identify, that stand rough usage, that won't crack, get gummy or peel, that will keep fire hazards to a minimum. That's why the A. C. Gilbert Company selected wire with insulation made from GEON. It can be brilliantly colored in a wide range, it wears indefinitely, resists aging and ozone, and is self-extinguishing—won't support combustion.

Hundreds of other products made from GEON—raincoats, handbags, luggage, upholstery, tablecloths, tank linings, fly swatters, to name a few—have these properties plus resistance to foods, acids, water, oil, heat, cold, sun, air, mildew, and many other normally destructive factors. They may be extruded, pressure or injection molded, calendered or cast into sheet or film. GEON may be applied as a coating to fabrics, fibres, and papers of all kinds. There are applications for GEON in *every* home, in *every* industry.

While we make no finished products from GEON raw materials, we will be glad to work with you on any special product problems. Just write DepartmentM-9, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

Geon
Polyvinyl Materials

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

W. L. Cook, Editor

Challenge of Fact

Something more than an arresting challenge was placed before paper maker members of the Waxed Paper Institute early in the summer when its Industrial Relations Committee recommended that Charity begin at home through a proved capacity for cooperation. Basically the argument holds that while co-operation from labor is a constant subject of conversation, a searching study of industry's own case would probably develop methods by which industry could help itself.

A national figure in labor circles, speaking before a private group a year or two ago, offered the thought that his organization had made rapid strides because every time it went into a conference it had marshalled more facts than had its opposition, could talk more convincingly, and through that mechanism, had been able to dominate the meeting. This lends force to the expressed hope of the Waxed Paper committee that an industry-wide industrial relations program should have the full study and cooperation of every member of the industry.

For, says Chairman F. J. Massey, management must assume leadership in labor legislation. The starting point, and in his opinion the only legislative assistance required by society to bring about industrial peace, is to enact into law a measure compelling unions and all other so-called non-profit organizations to incorporate—thereby being subservient to all municipal, state, and federal laws. The danger to society not only of unions but of many other forms of militant organized minorities is serious, and is tending to destroy our basic institutions including the Constitution itself. It is also a serious threat of possible dictatorship.

If management is placed in position to bargain with responsible units representing labor, which are amenable to the same laws as management, industrial peace will be a natural result. The real trouble with our national situation is declared to be moral deterioration. Practical Christianity has all but died except for lip service. The ancient trinity of Golden Calf, Selfishness, and Materialism is now our deity. This is reflected in practically all of our social activities. It is the motivating influence in the actions of labor and other powerful organized minorities. The public at large reflects the same influence in its Black Market activities. The major portion of our population is operating either as buyer or seller in this unlawful traffic to the further degradation of civic morality.

The committee endeavored to analyze the cause of any unrest, dissatisfaction, and confusion in the labor relations in our branch of the industry. These observations indicate fewer problems and less confusion in this group than anywhere else in industry. The operations of this group through its collective thinking are much more stable than the thoroughly confused state of the public mind. Confused thinking breeds unrest and disorder. If successful accomplishment in establishing and maintaining peaceful relations with labor is assured, of necessity, the present course of mental balance will be maintained.

Organized or un-organized labor is powerful in this period of a sellers' market, and cannot be awed by the President, Congress or any other authority. Therefore, organized labor's demand for higher wages cannot be criticized. However, strikes and unreasonable demands are part of the technique, and these excesses can be prevented through intelligent approach to the problem by management and labor representatives, both of whom have definite responsibility to society. Management cannot succeed in achieving industrial peace if labor representatives of irresponsible "unions" without either financial or social responsibilities represent labor; on the other hand, ultra-conservative representatives of management will also prevent reaching successful agreements.

Job analyses data are most imperative at this time. The unions are making job analyses in the paper mills today. The Institute office has asked these companies for an explanation in the hope of learning some good reasons against job evaluation.

Those companies which have not made a job evaluation are making a mistake. The advantages far offset any objections, as proved in a great many instances.

Getting all job rates in true relation to one another will result in better personnel relationship between employees as well as between management and labor. Dissention, which leads to misunderstanding and, in many instances to strikes, is eliminated thereby.

Labor is making security its main objective. Labor wants the security of a minimum weekly-yearly wage.

Are the members of this industry ready to discuss intelligently the feasability and the cost of application of such a program? Have they determined the increased cost per machine hour? Can they secure sufficient co-operation from labor to amortize any increased cost by increased production? Or are they going to wait until forced to grant such a concession willy nilly? In the latter instance, they surely will receive little or no credit from the working force.

The minimum weekly-yearly wage is not something in the future, it is here now. A large number of industrial units already have established it. The application varies with the seasonal character of the individual company's business.

Labor has always regarded piece work with suspicion, and perhaps justly so. In many instances, unfair practices, such as changes in base production figures, were employed. The adoption of management and labor of some static production unit would eliminate the principal cause of objection from labor to measured work of any kind.

Calendar of Coming Events

September 20-21, 1946—Annual Meeting, Southern Paper Trade Association. Hotel Buena Vista, Biloxi, Miss.

September 26-28, 1946—TAPPI General Fall Meeting, Hotel Statler, Detroit, Mich.

October 2-4, 1946—TAPPI Engineering Conference, Pfister Hotel, Milwaukee, Wis.

October 17-19, 1946—National Paper Trade Association. Fall Convention, Edgewater Beach Hotel, Chicago, Ill.

TAPPI Notes

Frederick Wierk, formerly of Merritt-Chapman & Scott, is now engineer for Ebasco Services, Inc. (subsidiary of the Electric Bond and Share Company) 2 Rector St., New York 6, N. Y.

W. M. Shoemaker, formerly of the Downingtown Mfg. Company, is now consulting engineer at Sunny Acres, Kennett Square, Pa.

Durward B. Geffken, formerly of the U. S. Marine Corps, is now in the technical department of Johns-Manville Corporation, Manville, N. J.

Stewart V. Rogers, formerly of Kenneth A. McIntyre Associates, is now plant manager for So-Lo Works, Inc., Loveland, Ohio.

H. Y. Charbonnier is now assistant technical director for the Union Bag & Paper Corporation, Savannah, Ga.

Freeman Perry is now chemist for the Chemical Paper Mfg. Co., Holyoke, Mass.

John Henderson, manager of the South African Pulp and Paper Industries, and Harold Rogers, mechanical engineer for the Union Corporation Ltd., of South Africa, are visiting mills in the United States and Canada.

Many reservations are being received for the meetings of the Technical Association of the Pulp and Paper Industry to be held at Detroit and Milwaukee. The Detroit meeting (September 26-28) will be devoted to a consideration of the trends evident in pulpwood and woodpulp manufacture and the Milwaukee meeting (October 2-4) will consider a number of the current engineering problems being faced by most paper mills that are planning a rehabilitation or expansion program. Although housing facilities are limited in both cities there is still an opportunity for about 100 more registrants at each meeting. Requests for reservations must be sent to R. G. Macdonald, Secretary TAPPI, 122 East 42nd Street, New York 17, N. Y.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1946		Corresponding Weeks—1945	
July 13	95.2	July 14	88.5
July 20	102.8	July 21	89.8
July 27	104.7	July 28	93.4
August 3	105.2	August 4	93.6
August 10	103.4	August 11	93.0
August 17	*104.5*	August 18	67.8

COMPARATIVE MONTHLY SUMMARIES

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	91.0	89.7
1946	94.7	98.4	104.4	102.7	100.7	104.6	*94.0*						

COMPARATIVE YEARLY SUMMARIES

	1939	1940	1941	1942	1943	1944	1945	1946
Year to date	78.7	86.9	94.2	93.8	88.1	87.7	87.7	*99.8*
Year Average	83.4	85.6	97.4	90.4	87.8	88.1	89.7	

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1946		Corresponding Weeks—1945	
July 13	87	July 14	90
July 20	94	July 21	96
July 27	95	July 28	95
August 3	98	August 4	94
August 10	96	August 11	94
August 17	*98*	August 18	67

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1945	91	95	97	97	96	96	86	90	91	97	95	85	93
1946	90	97	100	99	94	97	*89*						

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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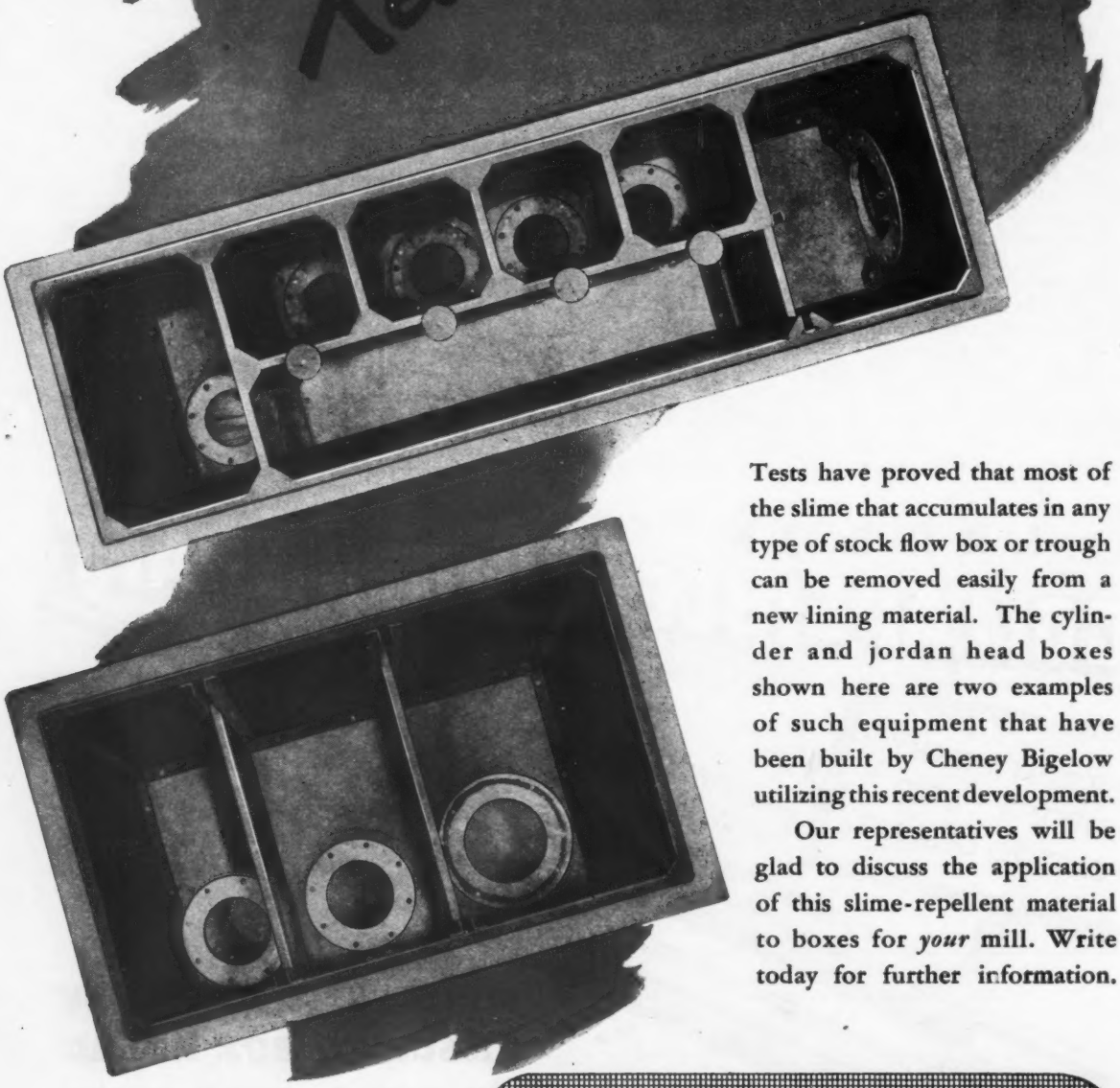

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Edited by R. G. Macdonald, Secretary

First Cut Linter Cotton for Papermaking*

By William H. Jones[1]

Abstract

First cut cotton linters is a new fiber source for cotton content papers. Cotton and its byproducts are discussed briefly. The source, grading, purification, and uses of the various types of linter cotton are outlined. General procedures for handling, digesting, bleaching, and hydrating first cut linter cotton by fine paper mills are given. First cut linter cotton has longer fiber length and develops greater strength than mill run or second cut linter cotton. Purified linter cotton does not hydrate as readily as rag halfstocks.

The use of first cut cotton linters in the making of cotton content paper is a new development in the paper industry. For a number of years cotton linter pulp made from second cut cotton linters has been used as a filler in papermaking.

However, the decrease in the supply of cotton rags for cotton content paper brought about not only by a war economy but also by the increased use of synthetics in the textile world plus chemically treated merchandise, pointed out the need for a new source of supply of cotton suitable in quality and quantity for fine papermaking.

The Railway Supply and Manufacturing Company having had years of experience in the handling, processing, and manufacturing of cotton, owning and operating cotton mills and making other consumer goods employing various fabrication methods, analyzed the needs of papermakers. This analysis led to the conclusion that an added source of supply lay in the securing of the proper virgin cotton and its subsequent handling by the mills. To this end, research and experiments were carried through to secure the most satisfactory types of cotton linters for fine papers.

That cotton linters are important to the paper industry is shown by the fact that in January, 1944, the relative consumption of rags to linters was 94% to 6%, while in December, 1945, linters had advanced to 40% as compared to 60% rag fiber.

It must be remembered, that cotton linters are virgin cotton fiber. This virgin fiber was at one time a wasted byproduct of the cotton industry. However, the research that has been carried out and the efforts made throughout the industry in improving its quality and subsequent value, both to the cotton producer and manufacturer, have raised this commodity to a definite value level.

Before going into this program, the progress made, and its future, the source of these materials are reviewed.

Cotton

Cotton has been known for many years but its greatest development in this country did not begin until after the invention of the cotton gin in 1793. From that time on, cotton developed to the point where it is the most important cash crop in the United States with nearly ⅓ of all American farms raising cotton. Of the annual consumption of all fibers, (1940-1943) cotton ranked first with a percentage of 67.7% *(1)*.

In the story of cotton, it should be remembered that the raising of the product is but one phase of the industry. The cotton gins, oil mills, warehouses, spinning, and weaving mills, its distribution, both domestic and export are all part of this industry. These are all related to the story of cotton and its final distribution to the ultimate consumers which means cotton in some of its forms, provides a living to one out of every ten working Americans.

The cotton plant itself consists of the stalk on which, when ripe, is a pod or capsule known as the cotton "boll". The size of this boll varies greatly on different varieties of plants with the species variation even greater. When the boll is fully ripened, the capsule cracks or splits and the cotton within expands in a white fluffy mass.

The only portions of the boll of commercial value are the lint or staple cotton, linters, and cotton seeds.

Lint or staple are cotton fibers removed from the seed in the ginning process. It is interesting to note that it takes approximately 1600 pounds of seed cotton to produce one 500 pound bale of lint cotton.

Fiber length of cotton varies according to variety. The long staple peeler variety has an average fiber length of 1⅛ to 1⅜ inches. Other varieties such as Meade and Sea Island cottons average 1½ inches in length where the short staple upland variety averages only ¾ to 1⅛ inches in length.

From the lint cotton comes fine cotton yarns used in innumerable fabrics and having many purposes which are common in daily life.

From cotton linters comes the lower grade of cotton yarns, stuffing materials for mattresses, furniture, and automobile upholstery, and other articles where the cotton itself is easily discernible. In addition, linters are used as a source of raw material in many plastics, paints and lacquers, synthetic yarns, explosives, cellophane, and paper.

The cotton seed itself gives cotton seed oil

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[1] Member TAPPI, Vice-President, The Railway Supply & Mfg. Co., Cincinnati, Ohio.

which incidentally amounts to about 15% of the cotton seed by weight and accounts for about 55% of its value. Cotton seed oil, after refining, gives one of the principal fats. It is used in shortening, margarine, salad dressing, salad oil.

The cake or meal of the cotton seed is used principally as a feed for live stock. Also, it can be used as fertilizer and in recent years, there has been produced a cotton seed flour that is rich in protein and vitamin B and practically free of starch.

The hulls, like cotton seed meal, are used primarily as a live stock feed.

The above outlines a few of the leading uses of cotton, linters, and seed. Tables I, II, and III show in detail and considerably expand on the many uses of this important product.

Cotton Linters

After the long staple cotton has been removed in the ginning process, the seed is left covered with fibers known as "linter cotton". Linters are composed of two types of fibers—the long, soft, or flaccul fibers that have escaped removal during ginning and the shorter more deeply colored fuzz fibers that are matted about the seed coat. The term "linters" is derived from the fact that these fibers are removed from the cotton seed by a machine similar in design to the cotton gin called a "delinting gin." After the seed is delinted at the cotton oil mills, it is crushed and cotton seed oil produced.

The cotton linter production amounts to approximately 10% of the total cotton production, or about 1 million bales in a normal crop year.

Types and Grades of Linters

There are three types of linters:

1. *First Cuts* are the longer fibers obtained on the first delinting when the cotton seed is processed twice through the delinting machine.
2. *Second Cuts* are linters recovered in the second passage of the cotton seed through the delinting machine. These are much shorter than first cuts.
3. *Mill Runs* are linters obtained when the cotton seed is run only once through the delinting machine. These are composed of both long and short fibers.

Grading of Linters

Our company buys large quantities of linters from the cotton seed oil mills, through its own field men. Samples of all linters bought are examined by licensed linter classifiers and all data recorded. Every car of linters is carefully checked by field inspectors and samples sent to the central sample room at Cincinnati.

These samples are graded according to Staple, Cleanliness, Color, and Character.

Staple refers to maximum, minimum and average staple lengths or preponderance of one or the other of the lengths of fiber of which linters are composed.

Cleanliness refers to freedom from foreign matter, such as broken leaves, motes, sticks, dirt, seed coat particles, or hulls.

Color—color of linters may vary from olive to buff. The linters often have a greenish, reddish, or cream cast.

TABLE I.—GENERAL BREAKDOWN OF USES OF WHOLE COTTON

WHOLE COTTON ..	Lint or staple cotton	Clothing Industrial Household
	Cottonseed	Meats (kernels) Hulls Linters

Character (refers to harshness or softness and resiliency). These are often influenced by the soil, seed variety, and climatic conditions.

Allocation of Linters

Allocation of the linters are made according to the classification for the uses outlined in Table IV.

Purification of Linters

Linter cotton is high in cellulose content. First cut linters have the advantage of longer fiber length and develop more strength than either second cuts or mill runs. While second cut linters are less expensive and are suitable for bleaching purposes, they do not have the fiber length of first cuts.

Linter cotton can be easily purified. The usual steps consist of removing the heavy contaminants, field-trash, etc., by mechanical means, and then cooking or digesting the linter cotton in mild alkaline liquors. This is followed by bleaching, proper washing and drying. The degree of purification that can be effected is shown in Table V *(4)*.

Chemical cotton is prepared from second cut linters or the lower grades of mill runs in the same general manner as first cut linters for paper which will be described in more detail. Chemical cotton is dried on a fourdrinier machine and baled in sheet form for viscose rayon and dried in loose form for other uses. Drying in loose form employs a riffler to remove dirt, a thickener, picker, and tunnel drier.

TABLE II.—STAPLE COTTON PRODUCTS AND USES

LINT OR STAPLE COTTON	Clothing	Accessories Athletic uniforms Coats Costumes Dresses Foundation garments Hosiery Infants' wear Shirts Sleeping, lounging Suits, pants Underwear
	Industrial	Airplane wings, etc. Athletic equipment Automobile seats, tires, etc. Bagging Barber supplies Belting Building supplies Canvas shelters Farm equipment Filter cloths Flags and displays Upholstery Insulation Laundry supplies Luggage Marine equipment Meat packaging Medical supplies Mortuary supplies Office equipment Publishers' supplies Railroad equipment Shoe materials
	Household	Bathroom accessories Bed cottons Bed covers Bedding Curtains Floor coverings Furniture covers Table cottons

During the war years, there was a heavy demand for chemical cotton for high tenacity rayon cord, rocket powder and other explosives, etc., and all linter cotton was under strict government allocation. A very short fiber called "hull fiber" obtained from grinding the seed hulls and separating the fiber from the bran was also used as a source for chemical cellulose. Hull fiber requires special technique in handling to prevent field losses. To alleviate a possible shortage of raw materials for chemical cotton, the United States Government Southern Regional Laboratory at New Orleans, developed a cotton cutting machine.

TABLE III.—USES OF COTTONSEED PRODUCTS

COTTONSEED	Meats	Shortenings
		Margarine
		Salad dressing and oil
		Cosmetics
		Medical preparations
		Washing powder
		Soap
		Glycerine
		Candles
		Phonograph records
		Animal feed
		Fertilizer
	Hulls	Livestock feed
		Fertilizer
		Stuffing material
		Insulation
		Xylose
		Cellulose
	Linters	Mattresses
		Upholstery (automobile and furniture)
		Cushions
		Comforts
		Absorbent cotton
		Bandages
		Gauze
		Wicks
		Twine
		Carpets
		Paper
		Cellophane
		Explosives
		Plastics
		Rayon
		Lacquers
		Enamels

This machine *(5)* cuts raw cotton to 1/10 inch lengths suitable for use as a source for chemical cellulose.

Linter cotton varies considerably in fiber length. The following is a comparison of the mean fiber lengths of raw linter cotton determined by the array method:

	Mean Length, mm.
First cut linters	
Grade A	7.1
Grade B	6.3
Mill run linters	
Grade A	5.1
Grade B	3.6
Second cut linters	2.0

Chemical treatment and processing will tend to reduce the fiber length of linter cotton. First cut linters are used where maximum fiber length and strength are required in the finished sheet. Mill run linters are sometimes used in papeteries where strength is not too essential. The various grades of second cut linters are generally used in small percentages for filler or bulk to give formation and appearance to the sheet.

Handling of Linters at Paper Mill

Linter cotton is shipped in tightly packed compressed bales weighing approximately 630 pounds. Each bale is carefully checked by field inspectors at the oil mills and samples approved by licensed graders at the central sampling room at Cincinnati. A normal carload of linters contains 75 bales.

On arrival at the paper mill, they are stored in a dry place until ready for use. There are various methods for preparing linter cotton for the digesters. Sometimes the bales are opened mechanically by a bale opening machine and fed by air stream to the digesters. Generally all rag room operations are eliminated and the linters are placed in the cooker in layers of 50 to 100 pounds.

Digestion of Linters

Linter cotton contains small amounts of vegetable oils, waxes, and pectates, together with some hull matter (seed coat of the cotton seed) and field trash. Hull particles can be removed by alkaline digestion.

Linter cotton must be cooked under carefully controlled conditions. Concentration of the alkaline liquors together with temperature and time of cooking will affect the cellulose purification and final viscosity of the fiber. The use of various type wetting agents in small amounts in the digestion process helps in saponification and elimination of undesirable impurities. Various soaps or commercial detergents such as American Cyanamid's "Aerosol," Rohm-Haas "W-30", National Oil Product Company's "Nopco", or pine oil can be used.

For the digestion of raw linters, mild solutions of caustic soda (1.5 to 3.0% NaOH) are more satisfactory than cooks of lime and soda ash. The horizontal rotating rag boiler is the most common type of digester although the vertical stationary and spherical rotating types are also used. The latter type assures good circulation and prevents pockets. For proper cooking, uniform mixtures of alkaline liquor and linter cotton plus time and temperature controls, are necessary.

A general cooking procedure is as follows: Water, caustic and wetting agent of the required strength and equal to three-fourths the total amount used are added to the cooker and then the linter cotton distributed through the manholes. The manhole lids are screwed tight and steam admitted to warm the water and wet the cotton linters.

The cooker is rotated for about 15 minutes and then vented, manhole lids removed, and balance of linter cotton and cooking liquor added. This method of wetting down the linter cotton will enable the operator to use more cotton per cook. Linter cotton is naturally fluffy and bulky and the total cooker capacity cannot be utilized without this wetting-down operation.

The weight of caustic should be approximately 8% of the linter cotton. The air is vented and steam pressure raised to 30 to 40 p.s.i. An average cook may take 4 hours at full temperature and results in the saponification of waxes, oils and fats, removal of the pectates, and destruction of the various impurities.

In general, high grade, long fiber, clean, linter cotton can be more easily cooked and bleached than lower grade linters. By modification of the cooking formula, it is possible to remove by cooking small amounts of foreign matter sometimes present in the raw linters.

It is very important to wash the linter cotton at the completion of the cooking cycle to remove excess caustic. Some mills employ the laundry principle, washing the linters directly in digester after the steam pressure has been released. Other mills discharge most of the cooked linters through the manholes

TABLE IV.—USES OF LINTER COTTON PRODUCTS

FIRST CUTS	Low grade yarns	Rope
		Twine
		Wicks
		Carpet filler
	Surgical dressings	Absorbent cotton
		Bandages
		Gauze
	Stuffing materials	Mattresses
		Upholstery (auto and furniture)
		Cushions and comforts
	Papermaking	Bond
		Papeteries
		Absorbent
		Specialties
MILL RUNS	Stuffing materials	Pads
		Mattresses
		Cushions
		Upholstery
	Chemical cellulose	Paper
		Rayon
		Cellophane
		Explosives
		Plastics
		Lacquers and enamels
		Photographic films

SECOND CUTS: Chemical cellulose (Same uses as mill runs.)

TABLE V.—TYPICAL ANALYSIS OF RAW AND PURIFIED LINTERS

	Raw Linters, %	Purified Linters, %
Chemical yield of cellulose (NaOH digestion)	80–85*	.....
Alpha-cellulose	.....	99
Ash	1.–1.5	0.1
Iron	0.06	0.002
Ether extract	1.0	0.20
Lignin (H_2SO_4 insoluble)	3.0	0.20
Moisture	6.0	5.0

* Recent data shows yields as low as 70 to 75% for some types of second cut linters and up to 88% for first cut linters.

flushing out the remainder with water and then washing until only a slight alkalinity is shown. Proper washing requires large quantities of water.

Bleaching of Digested Linter Stock

The linter cotton after cooking is grey or brown in color and requires a bleaching step to produce a white product. Calcium hypochlorate is the bleaching agent generally employed. Chlorine, hydrogen peroxide, permanganates are also used. The DuPont Company have recently developed a continuous process to bleach cotton and wool by means of hydrogen peroxide bleach *(6)* which may have possibility in the cotton linter field.

Many mills bleach in Hollander beaters equipped with washers (3% consistency) and at a relatively low temperature and 0.02 to 0.03% chlorine concentration, based on water solution.

After bleaching, the contents of the Hollander are soured by alum or sulphuric acid. Some mills omit this step on the theory that souring "tenderizes" the linter cotton. The partially bleached contents are then emptied into the "drainer" where the excess weak bleaching solution passes to the sewer. Drainers usually hold the contents of several beaters. The "draining" period varies for different mills but may last considerable time. Sufficient excess bleach solution remains with the halfstock to complete the bleaching action at very low chlorine concentration and minimum damage to the cellulose.

After the draining period is complete, the linter cotton halfstuff is removed from the drainers. It is sometimes pressed and baled for storage purposes until used. Some mills run the linter cotton halfstock over a wet machine and store in wet lap form.

Beating of Linter Halfstock

Bleached linter cotton pulp is generally used as part of the beater furnish with rag halfstock and/or bleached sulphite. Generally rag mills are equipped with conventional Hollander beaters of 500 to 1500 pounds capacity having beater tackle with sharp bars that will cut as well as hydrate rag fiber. Care must be taken to prevent excessive cutting of the linter stock.

It is well known that the pentosan content of pulps have a marked influence on beating *(7)* and that highly purified pulps do not hydrate *(8)* as readily as those having high hemicellulose contents. Linter cotton, which has been caustic treated and bleached, is one of these highly purified pulps containing little or no hemicelluloses and does not hydrate as readily as rag halfstock. An explanation *(9)* for the difference in rate of hydration of rag and linters is probably because of the manner in which the various fibers disintegrate under the action of the beater. Linen and cotton rags are frayed out and unraveled into a mass of very long fibrils by beating, whereas linter cotton breaks up into scattering particles or into coarse fibrils.

Since maximum fibrillation without cutting is essential for proper hydration, excessive cutting of the linter cotton stock must be avoided. Many mills brush the stock with a "light" roll. Some mills are now experimenting with stone roll and lava bedplate equipment similar to that employed in glassine mills and preliminary results are favorable.

Musser and Engel *(10)* ran a series of experiments comparing 1⅛-inch staple cotton, second cut linters and cotton seed hull fiber. It was shown that a lowering of the beating time results when the specific viscosity of the pulp is reduced to a value less than 10 (method recommended by Clibbens and Geake *(11)*) It was also shown that there was significant decline in quality of the paper because of viscosity reduction by chemical degrading. On a comparable viscosity basis, the physical properties decrease to a less extent with oxidizing agents than with acids. Obermanns *(12)* observed that over-bleaching of rag stock expedites beating and weakens the strength quality of the sheet.

On account of the importance of maintaining strength characteristics of linter cotton by a proper viscosity level, any attempt to increase rate of hydration by viscosity reduction or chemical degradation is not recommended. The viscosity should be over 200 cp. viscosity *(13)* TAPPI Standard Method, for best results.

The cooperation extended by the paper mills in carrying on experiments and tests has been and is continuing to be of major importance in the development of the processing of linter cotton from the raw stock through to the finished product. Studies include experiments on hydration as well as refinements of the processing technique and as additional results are secured, they will be published.

Literature Cited

1. Evans, Robt. B., Trends in fiber consumption, *Cotton* (January, 1945).
2. Facts about Cotton—Leaflet 167, Bur. of Agr. Ecom., U. S. Dept. Agriculture.
3. Through the cotton boll, National Cotton Seed Products Association, p. 14.
4. Anon., *Chem. & Met. Eng.*, 48, 108 (1941).
5. Asbill, Clarence M., Jr., and Hill, Grover B., U. S. pat. 2,370,568 (Feb. 27, 1945).
6. DuPont solomatic process for continuous peroxide bleaching.
7. Young, G. H., and Rowland, B. W., *Paper Trade J.* 97, 44 (Oct. 12, 1933).
8. Richter, G. A., *Ind. Eng. Chem.* 23, 131, 266 (1931).
9. James d'A. Clark in Emil Ott's High Polymers V, p. 363.
10. Musser, D. M., and Engel, H. C., *Paper Trade J.* (July 10, 1941; April 9, 1942; Aug. 20, 1942).
11. Clibbens, D. A., and Geake, A., *J. Textile Inst.*, 19, 77-92T (1928).
12. Obermanns, H. E., *Paper Trade J.* 103, No. 7; 109 (1936).
13. Jones, Wm. H., *Paper Trade J.* (Sept. 27, 1945).

New TAPPI Members

Miss Eleanor H. Bryant, Laboratory Assistant, Pacific Mills Ltd., Ocean Falls, B. C., Canada, a graduate of the University of British Columbia.

Kenneth J. Mackenzie, Assistant Superintendent of Paper Mills, Eastman Kodak Co., Rochester, New York. He attended Acadia University and the Massachusetts Institute of Technology, and has been with the Eastman Kodak Company since 1928.

Charles W. Tatter, Director of Quality Control, United States Gypsum Co., Gypsum, Ohio, a 1946 graduate of the Illinois Institute of Technology.

John B. Verdon, Chemist, American Cyanamid & Chemical Corp., Kalamazoo, Michigan. He attended Kalamazoo College, and was employed by the American Cyanamid & Chemical Corp. before going into the United States Army in 1941.

Carl E. Weaver, General Mill Superintendent, American Coating Mills, Inc., Elkhart, Indiana.

Walter L. Welch, Laboratory Assistant, Falulah Paper Co., Fitchburg, Massachusetts.

Isostatic Method for Determining the Gas Permeability of Sheet Materials*

By Donald W. Davis[1]

Abstract

Problems encountered in the packaging of foods in flexible sheet materials have led to the development of a method and apparatus for determining the gas permeability of such materials under isostatic conditions, i.e. involving no difference in total pressure across the sheet. The gas to be tested is passed over one side of the test sheets, which are held, free of any face support, in a diffusion cell and a different "sweep" gas is passed over the other side. Both gases are at approximately atmospheric pressure. The sweep gas entrains any test gas which permeates the test sheets and the permeated test gas is determined by chemical methods.

For carbon dioxide permeability, the oxygen, used as the sweep gas, is passed through Ascarite where the permeated carbon dioxide is absorbed and determined gravimetrically. For other test gases, such as oxygen or nitrogen, the carbon dioxide used as the sweep gas is absorbed in potassium hydroxide solution and the permeated test gas is determined volumetrically. Several advantages are claimed for this method. Carbon dioxide and oxygen permeability values are given for a wide variety of sheet materials at various temperatures and relative humidities. Water vapor permeabilities also can be determined by this method.

The need for information on the gas permeability of food packaging materials has been appreciated by many workers. Many foods are subject to deterioration through oxidation by atmospheric oxygen which may permeate into the package through the wrapper. Successful packaging of products in an inert atmosphere depends upon a package which will retain the inert gas and exclude atmospheric oxygen. In the packaging of cheese and coffee in hermetically sealed wrappers, provision must be made for the escape of the carbon dioxide which is evolved by these products. Such problems have made it desirable to have a method for determining the gas permeability of sheet materials.

Elder *(1)*, Schuman *(2)*, and Todd *(3)* have described methods for determining the gas permeability of sheet materials based on the measurement of pressure or volume changes as the test gas permeates from the high pressure to the low pressure side of the sheet. These methods employ as much as 1 atmosphere difference in total pressure across the sheet. This necessitates rigid support of the test sheet with resultant close contact with the support, which tends to reduce and leave in doubt the effective test area. This factor has been noted previously by Morris and Street *(4)* in relation to their apparatus. Meticulous sealing of the test sheet is necessary to avoid the interpretation of small leaks as permeated test gas. Although these methods are undoubtedly very useful, it was thought desirable to have a test method which would avoid the above difficulties and would simulate most use conditions encountered in food packaging.

Smith and Kleiber *(5)* point out the desirability of testing under conditions involving no significant differences in total pressure and have described an apparatus for measuring the rate of penetration of oxygen from the air into pouches made of the test material. This method is not readily adapted, however, to the testing of flat sheets, is not applicable (as designed) to gases other than air, and does not provide for the control of relative humidity to which the test sheet is exposed. Edwards and Strohm *(6)* have recently described a gravimetric method for carbon dioxide permeability based on the cup or Vapometer can method commonly used for water vapor permeability. This method avoids the use of sheet supports, but involves difficulties with total presure differentials due to the sealed cups. The authors point out also the difficulty of maintaining known differences in partial pressure across the test sheet where there is no circulation of gas on the absorption side.

In an earlier paper, Edwards *(7)* described a "penetration" method for determining gas permeability which was claimed to be superior to the "volume loss" method both in precision and reliability. In this "penetration" method different gases, at approximately the same total presure, are swept over the two sides of the test sheet and the amount of permeated test gas is determined by changes in refractive index of the opposite gas using the gas interferometer. The Cambridge fabric permeator *(8)* employs a similar principle but determines the permeated test gas by changes in thermal conductivity.

The present paper describes a method which is of the penetration type, but which employs chemical methods for determining the amount of permeated test gas. It has been designated an "isostatic" method because the total gas pressures on the two sides of the test sheet are essentially equal (in contrast to "pressure" methods). By using different gases, both at atmospheric pressure, on the two sides of the sheet, the difference in *partial* pressure with respect to the test gas is about 1 atmosphere. This may give rise to a transmission of test gas through the sheet independently of differences in *total* pressure. The operation of Dalton's law of partial pressures in relation to gas transmission through packaging materials has been clarified by Elder *(9)*. The condition of different partial pressures and equal total pressure on the two sides of the test sheet represents the usual conditions which are encountered with packages made from flexible sheet materials, except where vacuum packaging is used.

This method eliminates the need for rigid test sheet supports and avoids excessive stressing or compression of the sheets. With different gases on the two sides of the sheet, counter diffusion of the two gases takes place as with actual packages. In the ideal case gases will show their characteristic permeabilities toward a sheet material independently of the presence of other gases or vapors. However, there

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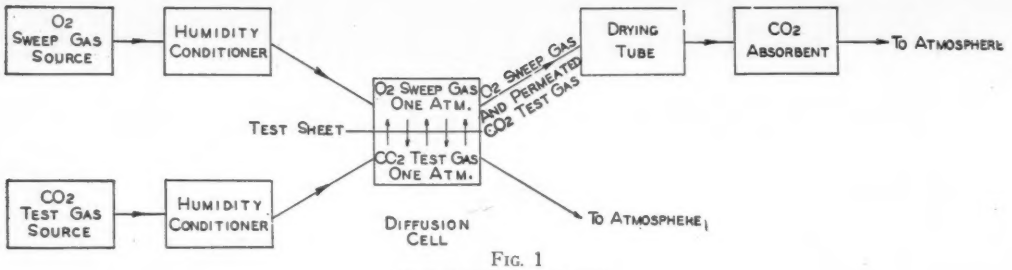


FIG. 1
Method for Carbon Dioxide

may be considerable divergence from this behavior in actual practice. It is recognized that, in general, the fixed gases show fairly independent behavior but numerous investigators have shown that the presence of vapors may markedly affect gas permeabilities. This is particularly true where the vapor has a solvent action or where it is strongly absorbed by the sheet material.

The mechanism by which gases permeate through solids may be quite complex. It is generally recognized that two principal mechanisms are involved: (a) pore permeation, which is due to diffusion of the gas through small pores or orifices in the sheet material and (b) solution permeation, in which the gas dissolves in the sheet material, diffuses through the sheet, and evaporates from the other side. Schuman *(2)* has elucidated the relationship of these two mechanisms to the conditions of the permeability method employed. The present method is designed primarily for determining solution type permeation. Although the method is essentially isostatic, involving no difference in total pressure across the sheet, it is feasible to operate the apparatus with the total pressure several millimeters of mercury higher on one side. In case pore type permeation is an appreciable factor with any sheet being tested, this will be shown by a large increase in permeation rate when the total pressure is slightly increased on the test gas side.

Principle of the Isostatic Method

The principle of this isostatic method is shown by reference to the schematic diagrams Figs. 1 and 2. The test sheet is held so as to form the partition between two chambers of the diffusion cell. The test gas is passed over one side of the sheet and a second gas designated as the "sweep gas" is passed over the other side. Both gases are preconditioned to the relative humidity desired in the test. By continuous flowing of both gases over the surface of the sheet, stagnation is avoided, the permeated gases are swept out, and the partial pressure of each gas on its own side is maintained at approximately 1 atmosphere. Any test gas which permeates the sheet is entrained by the sweep gas and is determined by appropriate means after exit from the diffusion cell. For carbon dioxide permeability (Fig. 1), oxygen may be used as the sweep gas, and the permeated carbon dioxide entrained is determined gravimetrically by absorption in Ascarite (a sodium hydrate asbestos absorbent). For other test gases, such as oxygen or nitrogren or air (Fig. 2), carbon dioxide is used as the sweep gas, which on exit from the diffusion cell is absorbed in potassium hydroxide solution. The permeated test gas which is thereby separated is collected and determined volumetrically in a gas analyzer. If desired, carbon dioxide and oxygen permeabilities may be determined simultaneously, in which case each gas serves as the sweep gas for the other.

Description of Apparatus

The diffusion cell (Fig. 3) is designed to accommodate from one to twelve test sheets 6⅛ inches in diameter, thereby giving a test sheet area of 29.5 to 354 square inches, respectively. Where twelve sheets are used they are held between thirteen copper rings which are assembled in a vertical stack. The top and bottom rings each are closed by a copper plate soldered to the face of the rings to form the end caps. The rings are numbered and marked to insure repeated assembly in the same relationship. Each ring has a copper tube soldered into opposite sides to serve as inlet and outlet to that chamber. The gas flow through each chamber sweeps across the surface of the test sheets which enclose it. The flow is distributed across the sheets by baffles soldered into each ring. The stack of rings, with interleaved test sheets, is held tightly together by compression in a screw press. Gas-tight sealing of the test sheets is accomplished by means of a gasket, on each side of each sheet, cut from a 0.005-inch thick sheet of Parafilm (a rubber-wax composition). Alternate chambers are then connected in series by means of glass tubing and heavy wall rubber tubing (Fig. 6 or 7) to give a two sided system with test gas on one side of the test sheets and sweep gas on the other. A manometer filled with mineral oil indicates the difference in total pressure between the two sides of the system. This assembly constitutes the diffusion cell.

The test and sweep gases are obtained from compressed gas cylinders provided with needle valves. For testing permeability under anhydrous conditions, the gases are dried by passing through tubes A (Fig. 7) filled with Dehydrite (magnesium perchlorate trihydrate). For testing under moist conditions, the gases are bubbled through sulphuric acid solution of the proper concentration to give the desired relative humidity. This solution naturally tends to change in concentration with use and the solution must be checked and adjusted periodically as required. The humidifying bottles B (Fig. 6) are equipped with sintered glass diffusers to improve gas-liquid contact. The gas is then passed through an empty bottle C (Fig. 6) which serves as a spray trap. The spray trap may be packed with glass wool to entrap any extremely fine spray which is carried over from the humidifying solutions. The flow rates of the gases to the diffusion cell are controlled by adjustable hydrostatic heads D and capillary type flow meters E. The temperature at which the determinations are made may be controlled, if desired, by placing the apparatus in a constant temperature room or cabinet. In the latter case, the portion of the apparatus used to determine the permeated test gas entrained in the sweep gas from the diffusion cell may be located outside of the cabinet for convenience.

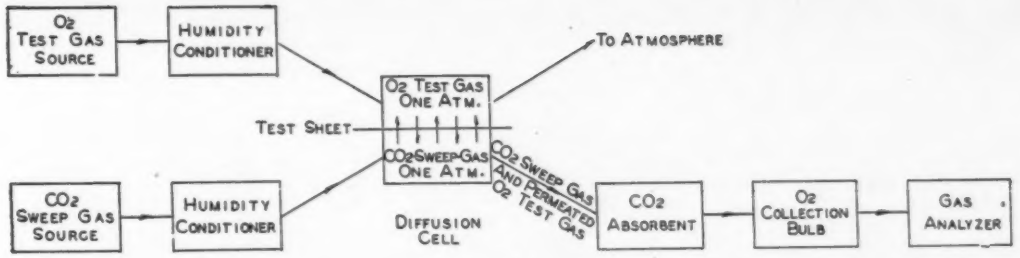


FIG. 2
Method for Oxygen

The apparatus for determining carbon dioxide permeation rates is shown in Figs. 4 and 6. Oxygen (or nitrogen or air) is used as the sweep gas and is purified by passing through a tube F filled with Ascarite to remove any carbon dioxide which may be present. The sweep gas flowing from the diffusion cell is passed through a tube G filled with Dehydrite to remove water vapor and then through weighed Schwartz type U-tubes H filled with Ascarite where the permeated carbon dioxide is absorbed and determined gravimetrically.

For determining the permeation rates of oxygen, or nitrogen, or other gases for which rapid quantitative absorbents are not available, a volumetric method of analysis is used (Figs 5 and 7). The sweep gas used in this case is carbon dioxide. The exit carbon dioxide sweep gas from the cell is passed into the bottom of a carbon dioxide absorption tube I containing 30% potassium hydroxide solution. As the bubbles rise in the tube, complete absorption of the carbon dioxide takes place. The permeated test gas which remains unabsorbed is collected over 30% potassium hydroxide solution in collection bulb J. Potassium hydroxide is used instead of sodium hydroxide because the much greater solubility of the potassium carbonate which is formed avoids the formation of troublesome crystals in the absorption tube. Use of the concentrated caustic solution minimizes the error introduced because of solubility of test gases in this solution.

When the potassium hydroxide solution loses its carbon dioxide absorption capacity through conversion to potassium carbonate it is siphoned out the bottom of the absorption tube through a rubber tube K into a suitable receiver. This causes fresh caustic solution to siphon from the Mariotte's bottle L into the top of the absorption tube I. Slight suction is applied to the Mariotte's bottle at M so that the atmospheric surface of the caustic solution in the system stands at the bottom of the inlet tube O. By placing this surface on the same level as the gas inlet P at the bottom of the absorption tube, the pressure at the latter point will be essentially atmospheric. In practice it is found necessary to lower the Mariotte's bottle 1 or 2 inches below this level in order to overcome surface tension of the caustic solution and maintain pressure equilibrium. The application of suction serves also to compensate for the solution displaced from the collection bulb J into the Mariotte's bottle by the accumulated test gas. When used in this way the Mariotte's bottle is a means whereby constant hydrostatic head is maintained on the caustic system irrespective of flow of solution into or out of the bottle. At the end of a test the accumulated gas is transferred from J through stopcock Q to a gas analyzer where the volume is measured. In the case of oxygen permeability the amount of oxygen is checked by absorption in alkaline pyrogallol solution. This solution, prepared according to the method of Wolf and Krause *(10)*, contains 15% pyrogallol, 18% potassium hydroxide, and 67% water.

Procedure

Mounting Test Sheets

Representative samples are selected for testing and are carefully handled to avoid mechanical damage. The sheets are cut 7¼ inches square to give a minimum of ¼ inch extension beyond the edge of the diffusion cell rings. For high permeation rates, only one test sheet is used. For lower permeation rates, up to twelve test sheets may be used in the diffusion cell to increase the test area and to improve the sensitivity of the determination. If specific permeabilities are to be calculated, the average caliper of the sheets is determined. The Parafilm gaskets are prepared from 7¼ square sheets by cutting out the center of the sheets with a knife, using an extra diffusion cell ring as a template. The portion of the gasket sheet extending beyond the diffusion cell is left in place for greater convenience in handling. The test sheets, with a Parafilm gasket on each side, are placed between the diffusion cell rings, using care to avoid wrinkling. The rings are assembled so that the copper inlet tubes on adjacent rings are separated by about 2 inches (Fig. 3) to prevent interference in connecting alternate chambers in series.

When all test sheets have been properly inserted between the diffusion cell rings, the assembled unit is compressed in the screw press to the maximum pressure obtainable with the 5-inch diameter knurled handle using hand leverage only. The Parafilm gaskets are sufficiently plastic under this pressure and

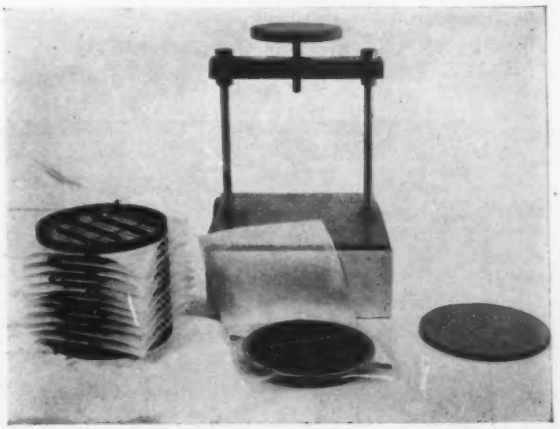


FIG. 3
View of Partially Assembled Diffusion Cell and Press

at room temperature to flow slightly and in about 0.5 hour of such compression essentially gas tight seals result. The assembly is then tested for leaks to the atmosphere by connecting the two sides of the system in series and applying about 2 inches of mercury pressure, as indicated by a manometer between the inside of the cell and the atmosphere. The cell should be tight enough to show no readable pressure loss in about 10 minutes. Smaller leaks than this will not be significant, for reasons discussed below.

After the diffusion cell has been loaded and checked for leaks it is connected to the test gas and sweep gas which have been conditioned to the desired relative humidity. Glass tubing is used, wherever possible, to connect the various parts of the apparatus. Butt junctions are made and joined with heavy wall gum rubber tubing to provide flexible connections. A minute amount of glycerine on rubber tubing connections is found to improve the tightness of the connection and it facilitates both making and breaking the union. The sweep gas flow rate is adjusted to 25 cc. per minute. This rate changes the gas in each chamber about every 10 minutes and serves to keep the partial pressure of the test gas on the sweep gas side of the sheet at a very low value. This rate is slow enough for quantitative absorption of the permeated test gas from the sweep gas. A test gas flow rate of 100 cc. per minute has generally been used in order to keep the partial pressure of the sweep gas on the test gas side of the sheet at a minimum value. These flow rates were found to be optimum with sheets of low permeability, but with sheets of very high permeability it may be necessary to increase both flow rates as required to maintain maximum partial pressure differentials.

The gases are allowed to flow through the diffusion cell at the above rates for at least 2 hours to allow equilibrium to become established before starting a test. With some types of sheets much longer flow time may be required to reach equilibrium. It was found, for example, that No. 300 MSAT cellophane loaded in the diffusion cell at 50% relative humidity required about three weeks time to attain equilibrium at 0% relative humidity so that a constant permeation rate was shown. With No. 300 PT cellophane, however, equilibrium appeared to be established after about three days. The slow rate at which the MSAT cellophane reaches moisture equilibrium is obviously due to the moistureproof lacquer coating on this grade. With sheets of this type it is desirable to precondition them to the desired relative humidity before loading in the diffusion cell.

Gravimetric Method for Carbon Dioxide

For the determination of carbon dioxide permeability (Figs. 4 and 6) the exit sweep gas from the diffusion cell is first passed through a drying tube G filled with Dehydrite. The dried sweep gas containing the permeated carbon dioxide is then passed successively through two Schwartz-type U-tubes H filled with Ascarite. About ½ inch of Dehydrite is used on top of the Ascarite in each leg of the U-tube and is held in place by a plug of glass wool. The second Ascarite tube is used only as a check on the first tube and it seldom shows any weight gain except with very high flow rates. A protection tube R filled with Dehydrite is used at the end of the train, followed by a back pressure bottle S containing water. The carbon dioxide test gas, on exit from the diffusion cell, is also vented to the atmosphere through a back pressure bottle T, by means of which the difference in total pressure between the two sides of the system can be maintained at zero or any desired small value.

After the gas flows have been maintained at equilibrium conditions through the assembled apparatus for about 15 minutes the Schwartz tubes are disconnected and weighed to 0.1 milligram on an analytical balance. While the Schwartz tubes are disconnected from the apparatus the sweep gas outlet is connected directly to the back pressure bottle to avoid disturbance of the equilibrium conditions in the system. The weighed Schwartz tubes are then reconnected in the original manner and the gas flows are maintained for a sufficient length of time to give a readily weighable amount of carbon dioxide in the absorption tube. Triplicate determinations should be made. In cases where the permeability is so low that a readily weighable amount of carbon dioxide is not obtained in 6 or 8 hours, the gas flows can be shut off by means of screw clamps at the inlets and outlets to the diffusion cell. The apparatus is then allowed to stand for 24 to 48 hours and at the end of the test period the gas flows are resumed at their original rate for a period of 2 or 3 hours to sweep out and absorb the permeated carbon dioxide which has accumulated on the sweep gas side of the system. Results are calculated according to the following equation:

$$\text{CO}_2 \text{ permeation rate} = \frac{w}{44} \times \frac{22{,}400}{\frac{a}{w}} \times \frac{24}{h} \times \frac{760}{(p + p_1 - p_2)}$$

$$= \frac{w}{ah\,(p + p_1 - p_2)} \times 9.3 \times 10^6$$

= cc. CO_2 (at 0° C. and 760 mm. Hg pressure) per square meter per 24 hours corrected to a difference in partial pressure of CO_2 across the sheet of 760 mm. Hg

Where w = weight of CO_2 absorbed in grams in time h
a = total test area of sheets in square meters
h = duration of test in hours
p = barometric pressure in mm. Hg
p_1 = back pressure on test gas side of diffusion cell in mm. Hg
p_2 = partial pressure of water vapor in test gas in diffusion cell in mm. Hg

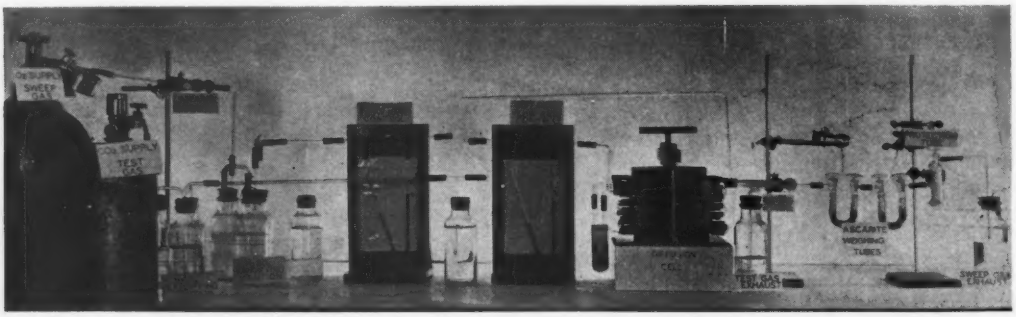


Fig. 4
Apparatus for Carbon Dioxide Permeability

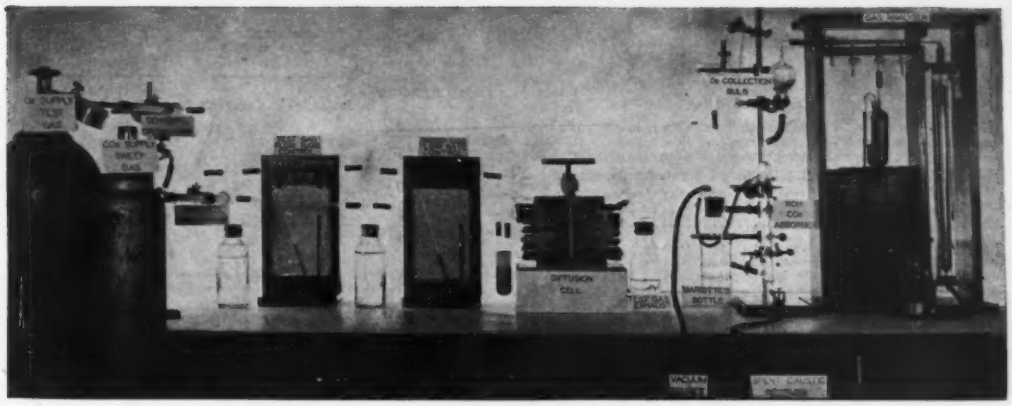


FIG. 5
Apparatus for Oxygen Permeability

VOLUMETRIC METHOD FOR OXYGEN

For the determination of oxygen permeability (Figs. 5 and 7) the diffusion cell is allowed to come to equilibrium as indicated above. The carbon dioxide sweep gas outlet from the diffusion cell is then connected directly to the gas inlet at the bottom of the carbon dioxide absorption tube containing 30% potassium hydroxide solution. The flow to the absorption tube is adjusted by means of screw clamp N so that the original sweep flow rate through flow meter E is maintained and a constant stream of small gas bubbles is introduced into the bottom of the absorption tube I. The carbon dioxide is almost completely absorbed in a travel of about 5 inches when the absorption tube contains fresh caustic solution. The need for fresh caustic solution in the system is indicated by an abnormally high rise of the carbon dioxide bubbles in the tube.

The sweep gas flow is continued for about 15 minutes to sweep out air entrapped in making the connection to the absorption tube. The gas flow is then discontinued by closing screw clamps P and U. This time marks the end of the preparatory period and the beginning of the test determination. The level of the caustic solution in the collection bulb J is then adjusted to the mark V in the capillary outlet tube by opening stopcock Q and manipulating the leveling bulb W. Stopcock Q is then closed and the sweep flow is resumed by opening screw clamps P and U. The test is continued until an easily measurable amount of permeated oxygen has been accumulated in collection bulb J. The screw clamps P and U are then closed and the accumulated oxygen is transferred to the gas burette X through stopcock Q and is mixed with about 25 cc. of oxygen-free nitrogen. The total volume is recorded, then the amount of oxygen present is determined by absorption in alkaline pyrogallol solution contained in gas pipet Y. The oxygen permeation rate is calculated according to the following equation:

$$\text{Permeation rate} = (v-b) \times \frac{273}{t} \times \frac{(p-p_2)}{760} \times \frac{24}{ah} \times \frac{760}{(p+p_1-p_2)}$$

$$= \frac{(v-b)\ (p-p_2)}{aht\ (p+p_1-p_2)} \times 6.5 \times 10^3$$

= cc. test gas (at 0° C. and 760 mm. Hg pressure) per square meter per 24 hours corrected to a difference in partial pressure of test gas across the sheet of 760 mm. Hg

Where v = volume of test gas collected in cubic centimeters
b = volume of test gas in cubic centimeters from a parallel blank determination
a = area of test sheets in square meters
h = duration of determination in hours
t = temperature in degrees Absolute at which volume v was measured
p = barometric pressure in mm. Hg
p_1 = back pressure on test gas side of diffusion cell in mm. Hg
p_2 = partial pressure of water vapor in test gas in diffusion cell in mm. Hg
p_3 = partial pressure of water vapor in mm. Hg in gas volume v when measured. (This is the pressure of water vapor from the 30% potassium hydroxide solution and the alkaline pyrogallol solution. These values are approximately equal and are taken to be 13 mm. Hg at 21° C.)

This equation is used also in calculating the permeation rate of other gases which are determined by the volumetric method.

Permeabilities as calculated by the above formulas are corrected from the conditions actually used, to rates which would be obtained at a difference in partial pressure of test gas across the test sheet of 760 mm. Hg, on the assumption that permeation rates are directly proportional to partial pressure difference, in accordance with Fick's law. Specific permeability can be calculated from the above permeation rates by means of the following equation:

$$\text{Specific Permeability in cc./sq. cm./min./cm. thickness} = \text{Permeation rate in cc./sq. meter/24 hr.} \times \text{Sheet Thickness in inches} \times 0.176 \times 10^{-6}$$

Precision

In the determination of very low permeabilities the precision of the results is improved by making a blank determination under conditions paralleling those of the test, and subtracting the blank from the test value. Blank determinations are made under the same conditions as the test except that the sweep gas is passed through both sides of the system. In the gravimetric method for carbon dioxide permeability the blank is usually negligible. With the volumetric method for oxygen or nitrogen, however, the amount of test gas contaminating the sweep carbon dioxide, and that which diffuses into the sweep side from the atmosphere through connections in the apparatus may become a significant quantity. In the case of oxygen permeability the blank obtained with the apparatus as here constructed and loaded with twelve test sheets may amount to the equivalent of a sheet permeability of 10 cc. oxygen per square meter per 24 hours. If the duration of the test is extended for several days, with sweep flow for several hours only at the end of the test, it is possible to reduce the blank to the equivalent of 1 cc. oxygen per square meter per 24 hours. This value must therefore be considered approximately the limit of sensitivity of the volumetric method.

The sensitivity of the gravimetric method is limited by the fact that the minimum significant weight

TABLE I.—CARBON DIOXIDE AND OXYGEN PERMEABILITIES OF VARIOUS SHEET MATERIALS

Sample No.	Sheet Material	Thickness, inches	Temperature, ° C.	Relative Humidity, %	Permeation Rate,* in cc./sq. meter/24 hr.		Specific Permeability,* in cc./sq. cm./min./cm. thickness	
					Carbon Dioxide	Oxygen	Carbon Dioxide	Oxygen
1	Cellophane, No. 300 PT (renegerated cellulose)	0.0008	21	0	5	<1	0.0008×10^{-6}	$<0.0002\times10^{-6}$
1	Cellophane, No. 300 PT (renegerated cellulose)	0.0008	21	30	12	....	0.0017×10^{-6}	.....
1	Cellophane, No. 300 PT (renegerated cellulose)	0.0008	21	75	99	49	0.014×10^{-6}	0.0069×10^{-6}
2	Cellophane, No. 300 MSAT (lacquered regenerated cellulose)	0.0009	21	0	24	<1	.....	.....
3	Cellulose acetate	0.0009	21	0	17,000	2,300	2.7×10^{-6}	0.36×10^{-6}
3	Cellulose acetate	0.0009	21	75	14,000	1,200	2.3×10^{-6}	0.19×10^{-6}
4	Ethyl cellulose	0.0010	21	50	120,000	22,000	21.0×10^{-6}	3.8×10^{-6}
5	Koroseal (polyvinyl chloride composition)	0.0012	8	0	1,000	....	0.22×10^{-6}	.....
5	Koroseal (polyvinyl chloride composition)	0.0012	8	75	450	....	0.095×10^{-6}	.....
6	Koroseal (polyvinyl chloride composition)	0.0013	8	0	1,000	480	0.23×10^{-6}	0.11×10^{-6}
7	Koroseal (polyvinyl chloride composition)	0.0016	21	50	920	190	0.26×10^{-6}	0.055×10^{-6}
8	Vinylite (polyvinyl chloride composition)	0.0010	8	0	800	200	0.14×10^{-6}	0.036×10^{-6}
8	Vinylite (polyvinyl chloride composition)	0.0010	8	75	....	150	.....	0.027×10^{-6}
9	Saran (polyvinylidene chloride composition)	0.0013	21	50	14	4	0.0032×10^{-6}	0.0009×10^{-6}
10	Saran (polyvinylidene chloride composition)	0.0013	21	0	48	....	0.011×10^{-6}	.....
10	Saran (polyvinylidene chloride composition)	0.0013	8	0	33	33	0.0075×10^{-6}	0.0076×10^{-6}
10	Saran (polyvinylidene chloride composition)	0.0013	8	75	35	31	0.0081×10^{-6}	0.0072×10^{-6}
11	Nylon (polyamide composition)	0.0009	8	0	302	63	0.048×10^{-6}	0.010×10^{-6}
11	Nylon (polyamide composition)	0.0009	8	75	170	46	0.027×10^{-6}	0.0073×10^{-6}
12	Nylon (polyamide composition)	0.0018	21	50	170	29	0.054×10^{-6}	0.0091×10^{-6}
13	Parafilm (rubber-wax composition)	0.0050	21	0	640	120	0.56×10^{-6}	0.11×10^{-6}
13	Parafilm (rubber-wax composition)	0.0050	21	75	550	120	0.49×10^{-6}	0.11×10^{-6}
13	Parafilm (rubber-wax composition)	0.0050	16	0	420	....	0.37×10^{-6}	.....
13	Parafilm (rubber-wax composition)	0.0050	27	0	840	....	0.74×10^{-6}	.....
13	Parafilm (rubber-wax composition)	0.0050	32	0	1,300	....	1.2×10^{-6}	.....
14	Pliofilm, tensilized (rubber hydrochloride)	0.0004	8	0	1,000	240	0.069×10^{-6}	0.017×10^{-6}
14	Pliofilm, tensilized (rubber hydrochloride)	0.0004	8	75	....	230	.....	0.016×10^{-6}
15	Pliofilm, tensilized (rubber hydrochloride)	0.0006	21	0	1,500	....	0.16×10^{-6}	.....
16	Pliofilm, grade NO	0.0009	21	0	310	110	0.049×10^{-6}	0.017×10^{-6}
16	Pliofilm, grade NO	0.0009	21	75	....	100	.....	0.016×10^{-6}
17	Pliofilm, grade NO	0.0013	21	0	1,500	....	0.34×10^{-6}	.....
18	Pliofilm, grade P2	0.0012	8	0	470	85	0.10×10^{-6}	0.018×10^{-6}
18	Pliofilm, grade P2	0.0012	8	75	320	66	0.068×10^{-6}	0.014×10^{-6}
19	Polyethylene	0.0010	22	0	14,000	3,500	2.5×10^{-6}	0.62×10^{-6}
20	Polyethylene	0.0030	22	0	610	1,000	3.2×10^{-6}	0.71×10^{-6}
21	Polystyrene	0.0015	22	0	16,000	3,100	4.3×10^{-6}	0.81×10^{-6}
21	Polystyrene	0.0015	22	75	....	3,200	.....	0.85×10^{-6}
22	Polyvinyl alcohol	0.0008	21	50	380	310	0.053×10^{-6}	0.043×10^{-6}
23	Polyvinyl alcohol	0.0010	8	0	<1	<1	$<0.0002\times10^{-6}$	$<0.0002\times10^{-6}$
23	Polyvinyl alcohol	0.0010	8	75	627	18	0.11×10^{-6}	0.0031×10^{-6}
24	Polyvinyl butyral	0.0042	21	0	16,000	2,300	12.0×10^{-6}	1.7×10^{-6}
24	Polyvinyl butyral	0.0042	21	75	16,000	2,400	12.0×10^{-6}	1.8×10^{-6}
25	Rubber, vulcanized dental dam	0.0087	21	0	45,000	....	69.0×10^{-6}	.....
26	Rubber, RCMA pale crepe cast from solvent	0.0067	20	0	61,000	9,300	72.0×10^{-6}	11.0×10^{-6}
27	Butyl rubber cast from solvent	0.0195	20	0	810	180	2.8×10^{-6}	0.62×10^{-6}
28	Vistanex (polyisobutylene) cast from solvent	0.0119	20	0	1,200	160	2.5×10^{-6}	0.34×10^{-6}
29	Greaseproof paper, 30 lb. (24×36—480)	0.0022	27	75	3,100	1,800	1.2×10^{-6}	0.72×10^{-6}
30	Glassine, 25 lb. (24×36—480)	0.0012	21	0	570	660	0.12×10^{-6}	0.14×10^{-6}
30	Glassine, 25 lb. (24×36—480)	0.0012	21	75	610	320	0.13×10^{-6}	0.067×10^{-6}
31	Glassine, 25 lb. (24×36—480)	0.0013	21	0	14,000	17,000	3.3×10^{-6}	4.0×10^{-6}
31	Glassine, 25 lb. (24×36—480)	0.0013	21	75	12,000	14,000	2.8×10^{-6}	3.3×10^{-6}

* Corrected to 760 mm. Hg difference in partial pressure of test gas across test sheet.

gain of the carbon dioxide absorption tube over a period of 48 hours (selected arbitrarily) is about 1 mg. With the maximum test sheet area this corresponds to a sheet permeability of 1 cc. carbon dioxide per square meter per 24 hours. The sensitivity of the determination could be further improved by extending the duration of the test beyond the 48 hour period. It is found with both methods that duplicate determinations on the same test specimens will usually check within ± 5%. The maximum permeation rate which can be determined with precision by either of these methods using a single test sheet is found to be about 1,000,000 cc. per square meter per 24 hours. This method is therefore useful in what might be referred to as the intermediate range of permeabilities. It is not adaptable to testing highly porous materials such as bibulous and bond papers and it is not sufficiently sensitive for the very low permeabilities of such materials as glass or continuous metal sheets. However, it does cover the permeability range of most flexible food packaging materials.

When the principle employed in this method is used, small leaks in the apparatus do not cause significant errors in the permeation results. Both gas systems are operated at some positive pressure above atmospheric pressure. Any leaks from the test gas side, including edge leakage along the test sheets, will be to the atmosphere and not to the sweep side of the system (see Fig. 3), hence, no error is produced. Likewise, any leakage from the sweep gas side is to the atmosphere and the resultant loss of permeated test gas will cause an error which is not greater than the ratio of the leak to the total sweep flow. With the degree of tightness of the cell indicated above, this will be negligibly small in all cases.

Results

The present investigation has been confined largely to the determination of carbon dioxide and oxygen permeabilities because of the greater interest in these gases in connection with food packaging. Nitrogen permeability was determined on a few sheets. The permeabilities found for a wide variety of sheet materials to carbon dioxide and oxygen at various temperatures and relative humidities are given in Table I. Different samples of the same sheet material may show wide variations in permeability. For this reason, comparisons to show the effect of any variable on permeability should not be made except where the determinations were made on the same sample.

Results show that varying the relative humidity between 0% and 75% has little or no effect on the gas permeability of such nonmoisture sensitive sheets as Saran, polystyrene, and polyvinyl butyral. With other materials which are also relatively nonmoisture sensitive, such as cellulose acetate, Koroseal, Nylon,

TABLE II.—GAS PERMEATION RATES OF SHEET MATERIALS EXHIBITING VARIABLE PORE-TYPE PERMEATION

Sample No.	Sheet Material	Thickness, inches	Temperature, ° C.	Relative Humidity, %	Difference in Total Pressure, inches mineral oil	Side With Higher Pressure	Permeation Rate,* in cc./sq. meter/24 hr. Carbon Dioxide	Oxygen
32	Sulphite paper, 23 lb. (24×36—480) supercalendered....	0.0018	26	75	0.0	.....	130,000	.....
32	Sulphite paper, 23 lb. (24×36—480) supercalendered....	0.0018	22	0	0.0	.....	120,000	.....
32	Sulphite paper, 23 lb. (24×36—480) supercalendered....	0.0018	22	0	0.5	Test gas	250,000	.....
33	Sulphite paper (duplicate of sample 32) coated one side with 28 lb. of paraffin wax.....	.....	26	0	0.0	.....	39	.....
33	Sulphite paper (duplicate of sample 32) coated one side with 28 lb. of paraffin wax.....	.....	26	0	0.5	Test gas	38	.....
34	Vegetable parchment 35 lb. (24×36—480) lard liner....	0.0024	21	0	0.0	.....	22,000	31,000
34	Vegetable parchment 35 lb. (24×36—480) lard liner....	0.0024	21	0	1.0	Test gas	170,000	170,000
34	Vegetable parchment 35 lb. (24×36—480) lard liner....	0.0024	21	0	1.0	Sweep gas	8,000	5,200
35	Aluminum foil	0.0010	22	75	0.0	.....	79	.....
35	Aluminum foil	0.0010	22	75	0.1	Sweep gas	.....	91
35	Aluminum foil	0.0010	22	75	0.6	Sweep gas	.....	91
36	Aluminum foil	0.0007	22	0	0.3	Sweep gas	1,700	.....
36	Aluminum foil	0.0007	22	0	0.2	Test gas	1,600	.....
36	Aluminum foil	0.0007	22	75	0.2	Sweep gas	1,400	.....
36	Aluminum foil	0.0007	22	75	0.9	Test gas	1,500	.....
36	Aluminum foil	0.0007	22	75	0.0	.....	.....	1,500
36	Aluminum foil	0.0007	22	75	0.8	Test gas	.....	1,500
37	Aluminum foil	0.0005	21	75	0.0	.....	10,000	.....
37	Aluminum foil	0.0005	21	75	0.6	Test gas	37,000	.....
38	Aluminum foil (duplicate of sample 37).....	0.0005	21	75	0.0	.....	1,400	.....
39	Aluminum foil (duplicate of sample 37) laminated to kraft paper, 25 lb., with 25 lb. of wax (24×36—480).....	.....	21	75	0.0	.....	8	.....

* Corrected to 760 mm. Hg difference in partial pressure of test gas across test sheet.

and Pliofilm, the gas permeability tends to decrease as the relative humidity is increased. Extremely moisture-sensitive sheets such as PT cellophane and polyvinyl alcohol show tremendous increases in the permeability to carbon dioxide and oxygen as the relative humidity is increased from 0 to 75%. However, in the case of glassine, which is also moisture sensitive, it was found that increasing the relative humidity had a tendency to reduce the permeability to carbon dioxide and oxygen.

The effect of temperature on permeability was not studied with most of the sheets. In the case of Parafilm it was found that increasing the temperature from 16 to 32° C. approximately tripled the permeability to carbon dioxide. In general it was found that the permeability of materials to carbon dioxide was higher than the permeability to oxygen.

The effect of carrying out the permeability test with a slightly higher total pressure on the test gas side to reveal pore type permeation is illustrated by the data in Table II. Sulphite paper and parchment have considerable porosity as indicated by the marked increase in permeation rate when the conditions are changed from isostatic to slightly higher total pressure on the test gas side. Aluminum foil, however, does not show this effect, except in the thinner gage (0.0005 inch), although pin holes could be detected in some samples of all gages tested when examined against an enclosed light source in a totally darkened room. The results show that pore type permeation is markedly reduced or eliminated when, for example, the sulphite paper is coated with a continuous film of wax or the aluminum foil is laminated to paper with wax.

The nitrogen permeability of several different types of sheets is given in Table III. In general, it has been found that the nitrogen permeability of most sheets is slightly lower than the oxygen permeability.

The tremendous difference in the gas permeability of different types of sheet materials is illustrated by the tabulated data. The specific permeabilities of rubber and dry polyvinyl alcohol to carbon dioxide, for example, show a ratio of at least 360,000 to 1. Care must be exercised in comparing gas permeability results determined by various methods which have been published by different investigators. The test conditions used are frequently different and in some cases not completely defined. Furthermore, different test methods might not be expected to yield identical results. Because of the wide variations in different samples of the same material, the only reliable means of comparing different permeability methods would be to make determinations with each method on the same test specimens using the same conditions of temperature and relative humidity.

The permeability method here described has been considered for the determination of water vapor permeability also. It should be particularly well adapted for determining the water vapor transmission rate between various relative humidity conditions. The

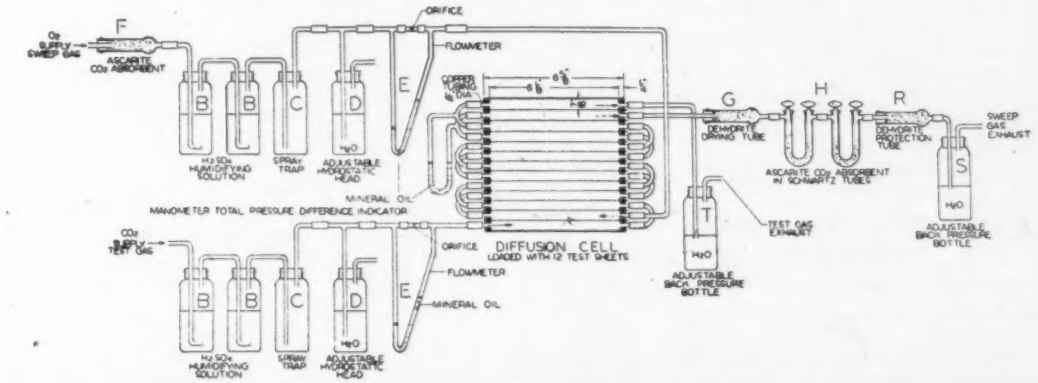


FIG. 6
Apparatus for Carbon Dioxide Permeability

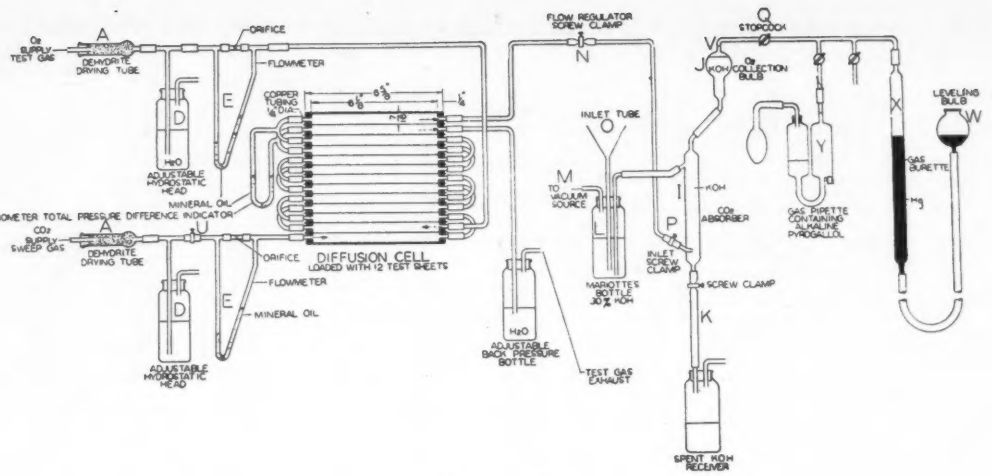


FIG. 7
Apparatus for Oxygen Permeability

TABLE III.—NITROGEN PERMEABILITY OF VARIOUS SHEET MATERIALS

Sample No.	Sheet Material	Thickness, inches	Temperature, ° C.	Relative Humidity, %	Permeation Rate,* in cc./sq. meter/24 hr.	Specific Permeability,* in cc./sq. cm./min./cm. thickness
1	Cellophane, No. 300 PT	0.0008	21	0	<1	$<0.0002\times10^{-6}$
1	Cellophane, No. 300 PT	0.0008	21	75	7	0.0010×10^{-6}
3	Cellulose acetate	0.0009	21	0	420	0.066×10^{-6}
3	Cellulose acetate	0.0009	21	75	320	0.051×10^{-6}
13	Parafilm (rubber-wax composition)	0.0050	21	75	97	0.087×10^{-6}
16	Pliofilm, grade NO	0.0009	21	75	32	0.0051×10^{-6}

* Corrected to 760 mm. Hg difference in partial pressure of nitrogen across test sheet.

large test areas which it makes possible might also be advantageous in determining water vapor transmission rates at low temperatures, which are of importance in frozen food packaging. A few preliminary tests indicate that the method is applicable to the determination of water vapor permeability but would have to be studied further to determine how such results correlate with values obtained by other methods.

Acknowledgment

The author wishes to express his appreciation to George Brabender for his helpful suggestions in the development of this method, and to Frederic Cherepow for assistance in carrying out much of the work and in the preparation of this paper.

Literature Cited

1. Elder, L. W., *Modern Packaging* 16, No. 11: 69-71 (July, 1943).
2. Schuman, A. C., *Ind. Eng. Chem., Anal. Ed.* 16, No. 1: 58-60 (January, 1944).
3. Todd, H. R., *Paper Trade J.* 118, No. 10: 32-35 (March 9, 1944).
4. Morris, V. N., and Street, J. N., *Ind. Eng. Chem.* 21, No. 12: 1215-1219 (December, 1929).
5. Smith, F. R., and Kleiber, Max, *Ind. Eng. Chem., Anal. Ed.* 16, No. 9: 586-587 (September, 1944).
6. Edwards, J. D., and Strohm, D. B., *Modern Packaging* 19, No. 2: 157-159 (October, 1945).
7. Edwards, J. D., National Bureau of Standards, Technical Paper T 113 (July 2, 1918).
8. Anon, *India Rubber World* 104, No. 5: 55 (August 1, 1941).
9. Elder, L. W., *Modern Packaging* 17, No. 6: 100-101 (February, 1944).
10. Wolf, Otto, and Krause, Artur, *Arch. Wärmewirt* 10: 19-21 (1929).

Emulsion Technology

The Chemical Publishing Company has issued a second enlarged edition of Emulsion Technology, Theoretical and Applied (377 pp. 5½ x 8½). Each chapter is written by an expert on the subject. This book was originally based on a symposium held by the leather trades chemists in England. In the enlarged edition there appears an up-to-date list of emulsifying agents classified in the following groups: anion-active, cation-active, nonionic and miscellaneous emulsifiers. Included is a chapter on the fundamental principles of practical emulsion manufacture by Miss R. M. K. Cobb of the Lowe Paper Co.

Among the subjects covered are: mechanism of emulsion, emulsions in the patent literature, industrial emulsion formulation, design of emulsifying machines, emulsion paints, rubber latex, asphaltic bitumen and the theory of emulsions.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $6.50 per copy.

Steam Trapping and Air Venting

The Chemical Publishing Company has recently issued a book entitled "Steam Trapping and Air Venting," by G. Nordcroft (172 pp. 5½ x 8½). This book points out that old knowledge and incorrect applications of steam traps should be forgotten before a steam using plant can be run economically. Stress is laid on the importance of correct and up-to-date methods of condensate drainage. From the standpoint of steam economy and output efficiency, adequate air venting arrangements for heating and process purposes are regarded as equally important.

The following subjects are covered: steam and condensate, steam trap types and installation, air in steam places, pans and evaporators, driers, process treatment by steam, steam mains, power plant and compressed air, sizing of steam pipes and condensate return pipes, condensation rates and steam tables.

Copies may be obtained from the Book Deparment of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $4.50 per copy.

Paper and Paper Stock Imports At New York and Other Ports

NEW YORK IMPORTS

WEEK ENDING AUGUST 24, 1946

SUMMARY

Cigarette Paper .....35 cs.
Newsprint .....8,185 rolls
Printing Paper .....31 cs.
Wrapping Paper .....789 rolls, 2 cs.
Paperhangings ...33 pkgs., 8 bls., 2 cs.
Filter Paper .....1 cs.
Tissue Paper .....6 cs.
Tracing Cloth .....12 cs.
Decalcomania Paper .....46 cs.
Parchment Paper .....9 cs.

CIGARETTE PAPER

S. Braunstein, Indochinois, Havre, 35 cs.

NEWSPRINT

H. G. Craig Co., G. D. D., Donnacona, 439 rolls.
Montgomery Paper Co., Thackery, Botwood, 6259 rolls.
H. G. Craig Co., Donpaco, Donnacona, 387 rolls.
News Syndicate Co., Robert Fiertz Barnes, Thorold, 1100 tons.

PRINTING PAPER

Oxford University Press, Joseph E. Johnson, Liverpool, 31 cs.

WRAPPING PAPER

(———), Elko Victory, Rauma, 789 rolls.
(———), Vretaholm, Gothenburg, 2 cs.

PAPERHANGINGS

F. Henjes, Inc., Argentina, Copenhagen, 33 pkgs.
W. H. S. Lloyd & Co., Kenyon L. Butterfield, Liverpool, 8 bls.; 2 cs.

FILTER PAPER

E. H. Sargent Co., Drottningholm, Gothenburg, 1 cs. (samples).

TISSUE PAPER

B. F. Drakenfeld & Co., Inc., Joseph E. Johnson, Liverpool, 6 cs. (pottery).

TRACING CLOTH

E. Dietzgen & Co., Vasconia, Liverpool, 12 cs. (bleached cotton).

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Inc., Muncie Victory, Liverpool, 46 cs.

PARCHMENT PAPER

Steiner Paper Co., Ogelthorpe Victory, Antwerp, 9 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., Sacramento, Hull, 45 bls. rags.
A. W. Fenton Co., Mormacgulf, Santos, 41 bls. cotton rags.
Railway Supply & Manufacturing Co., Mormacgulf, Santos, 464 bls. cotton waste.
Star Woolen Co., Mormacgulf, Santos, 31 bls. wool thread waste.
New England Waste Co., Mormacgulf, Santos, 168 bls. cotton waste.
The Heyman Co., Beatrice Victory, Santos, 447 bls. cotton waste.
Padawer Trading Co., Scottish Prince, Shanghai, 200 bls. cotton waste.
Riverside Mills, Scottish Prince, Shanghai, 100 bls. cotton waste.
O'Brien Products, Inc., Scottish Prince, Shanghai, 100 bls. cotton waste.
Darmstadt Scott & Courtney, Vasconia, Liverpool, 55 bls. old bagging.
(———). Vasconia, Liverpool, 17 bls. wool thread waste; 18 bls. wool waste; 6 bls. old wool rags.
New England Waste Co., Imediato Joao Silva, Recife, 300 bls. cotton waste.
Castle & Overton, Inc., Egidia, Glasgow, 600 bls. jute bagging.
(———), Egidia, Glasgow, 48 bls. old mixed dungaree rags.
J. Hein, Berkeley Victory, Santos, 6 bls. wool rags.
Amicale Trading Co., Berkeley Victory, Santos, 45 bls. wool rags.
Castle & Overton, Inc., Muncie Victory, Liverpool, 61 bls. new cotton rags.
W. T. Burnett & Co., Sweepstakes, Santos, 71 bls. cotton fly waste; 55 bls. cotton residue.
Williamson Products Co., Sweepstakes, Santos, 151 bls. cotton waste.
C. Kytz, Sweepstakes, Santos, 49 bls. cotton waste.

CASEIN

Hercules Powder Co., Mormacgulf, Buenos Aires, 2000 bags lactic casein, 100,000 ks.
E. Lang, Troubadour, Buenos Aires, 1666 bags casein.
Button Corp. of America, Troubadour, Buenos Aires, 1000 bags casein.

WOODPULP

Pulp Sales Corp., Elko Victory, Rauma, 4191 bls. white dry mechanically ground woodpulp, 837 tons.
(———), Elko Victory, Rauma, 630 bls. prime bleached sulphite pulp, 103 tons; 520 bls. prime unbleached sulphite pulp, 104 tons.
The Borregaard Co., Inc., Drottningholm, Gothenburg, 152 bls. dry bleached chemical sulphite pulp.

WOODPULP BOARDS

Jay Madden Corp., Elko Victory, Kotka, 698 bls., 155 rolls (solid white) 224 tons.

BOSTON IMPORTS

WEEK ENDING AUGUST 24, 1946

E. Butterworth & Co., Inc., Joseph E. Johnson, Liverpool, 91 bls. old bagging; 524 bls. cotton waste.
1st National Bank of Boston, Joseph E. Johnson, Liverpool, 11 bls. woolen rags.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 24, 1946

Perkins Goodwin & Co., Vretaholm, Gothenburg, 508 bls. unbleached sulphate woodpulp, 101 tons.
Pulp Sales Corp., Elko Victory, Rauma, 2428 bls. white dry mechanically ground woodpulp, 487 tons.
(———), Elko Victory, Rauma, 4125 bls. prime bleached sulphite pulp, 676 tons; 380 bls. woodpulp, 62 tons; 226 rolls wrapping paper.
(———), Elko Victory, Kotka, 3790 bls. prime bleached sulphite pulp, 676 758 tons; 750 bls. prime bleached sulphite pulp, 125 tons; 2070 bls. unbleached sulphate pulp, 414 tons.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 24, 1946

The Borregaard Co., Inc., Vretaholm, Gothenburg, 102 bls. dry chemical pulp, 20 tons.

Life Compensation Ordered For Permanent Disability

SPRINGFIELD, Mass.—New procedure under an amendment to the state workman's compensation law, which makes it possible to reopen a case after temporary payments had ceased and to order additional compensation for life under proof that the injuries sustained were of a permanent nature, have resulted in an adverse decision against the company insuring employes of the American Writing Paper Company of Holyoke.

The case was that of Henry Blain of Holyoke, 70, who was injured May 27, 1940, when he was struck on the left knee by the handle of a truck while working at the plant of American Writing. A synovitis developed for which he was paid $4,500 total disability to March 25, 1945.

Under a decision rendered today by Alphonse S. Bachorowski of the state industrial accident board, he is awarded $18 per week from the date previously set for termination of payments and to continue as permanent disability compensation. The back payments ordered amount to $1270.28 in addition to the $4500 previously paid.

The issue before the compensation board was to determine if the employe is totally and permanently disabled for work within the meaning of chapter 152, section 34a, of the General Laws. The commissioner found that the preponderance of expert evidence showed that the employe is permanently and totally disabled.

Conlan Represents Electron Equipment

BROOKLYN, N. Y.—The Conlan Electric Corporation, 1042 Atlantic Avenue, has been appointed as eastern engineering representatives for the Electron Equipment Corporation.

Week's Record of Trends in The Paper and Pulp Market

Office of the PAPER TRADE JOURNAL,
Wednesday, August 28, 1946

Indications within the trade are that recent price rises granted by OPA for writing paper grades are not expected to benefit the trade as much as they would have if they had been granted last June. Increases granted to compensate for higher labor, coal, fiber and freight costs, according to ammendment eleven to MPR 450, actually make up only about 50 percent of the rise in costs as reported by independent trade sources. However, the trade as a whole is hopeful that these price rises will increase production of low-end grades of writing papers to some degree. Meanwhile, over-all paper and paperboard supply remains tight, with book paper and newsprint most scarce. Extremely heavy demand for book paper, especially for publication paper at this date, is expected to continue well on into next year, with an increasing demand for coated book paper, as catalogue and direct mail plans reach new highs.

Daily newspapers reporting to American Newspaper Publishers Association show stocks of newsprint paper on hand were 37 days supply at the end of July 1946, which is an increase of seven days supply compared with stocks on hand at the end of June 1946. This 37 days supply at the end of July 1946 compares with 54 days at the end of July 1945, with 66 days at the end of July 1944, with 64 days for the 1943 period and with 52 days at the end of July 1941. Daily newspapers reporting to ANPA consumed 243,072 tons of newsprint in July 1946, compared with 177,905 tons in 1945 and with 215,012 tons for the like period in 1941. 1941 was the base year for calculating allowable use by newspapers under former WPB Order L-240 until revoked effective, Dec. 31, 1945. Total estimated consumption of all kinds of newsprint in the United States for June 1946 was 342,355 tons. For the first seven months of 1946 it was estimated to be 2,443,427 tons.

The British Paper Control is reported to have purchased new supplies of wood pulp from Sweden since the expiration July 1 of earlier Swedish-English contracts. The new quantities are estimated at 240,000 tons of chemical and 150,000 tons of mechanical pulp. This same British Paper Control is currently reported buying up some 100,000 tons of sulphite pulp from Canadian mills and rumor has it that price is no object to this group when it comes to the latter item. Which brings us to the point of reminding OPA once again that recent U. S. pulp price rises have only partly met Swedish expectations. This is particularly true of bleached pulp, for which American prices still are too low to make any considerable Swedish deliveries possible.

The index of general business activity for the week ended August 17 fell to 136.9 from 137.8 in the previous week, compared with 112.5 for the corresponding week in 1945. The index of paperboard production rose to 163.7 from 161.4 in the previous week, compared with 107.3 for the corresponding week in 1945.

Paper production for the week ended August 17 was estimated at 104.5 percent, compared with 103.4 for the preceding week, with 67.8 for the corresponding week in 1945, with 90.4 for 1944, with 90.9 for 1943, and with 81.2 percent for the corresponding week in 1942.

Paperboard production for the week ended August 17 was 98.0 percent of capacity, compared with 96.0 percent for the preceding week, with 67.0 for the corresponding week in 1945, with 95.0 for 1944, with 95.0 for 1943, and with 74.0 percent for the corresponding week in 1942.

Wood Pulp

Inventories of purchased pulp as of June 1 were reported holding up well. Overseas shipments have recently run better than 25,000 tons weekly; which is on a yearly basis of some 850,000 tons or more. Stocks of bleached sulphite and bleached kraft are relatively weak. 707,869 tons of pulp from Canada in the first seven months were 12,000 tons more than a year ago for the comparable period.

Swedish and Canadian shippers of pulp to the United States are hopeful of a 15 and 10 percent minimum increase respectively in the adjustable pricing formula which OPA made as of August 8. Meanwhile, delays in OPA's decision is costing the United States valuable shipments of pulp.

Rags

New cotton cuttings continue very tight with dealers in some cases finding it difficult to meet demands for most grades by paper mills. Cotton trade estimates a crop carryover of 3½ million bales moving to market next year, lowest figure in years; and half of which will be low-grade cotton. This low-grade cotton may be subsidized for sale to paper mills on about a 36c market basis scale.

Foreign dark cottons are still quoted at $72 to $80 in a currently limited market. Cotton sweeps at $50 find few bidders. Heavy wipers vary $50 to $55 per ton in 1 to 3 ratio combination deals with No. 1 and 2 specification rags.

Old Rope and Bagging

Old rope continues steady and firm at ceiling levels for all quality items. Large No. 1 sisal is 4.75c per pound, small sisal 4c, and No. 1 quality Manila 5.75c. Soft jutes are steady at 4.50 to 5.50c, while mixed strings command 1.75 to 2.00c per pound.

Buyers of bagging seem ready enough to absorb offerings in greater volume this week. Sales of 500 tons of mill run gunny at $4.62½ delivered, and British gunny at $4.25 dock plus freight were reported. Southern mill run bagging moves at $4. Regular No. 1 bagging quotations vary according to area from $4.37½ to $4.65. Scrap bagging goes at $3.50 to $3.75 in carlots; mid-west shredders pay $4.00 to $4.25 for their scrap bagging.

Waste Paper

Market varies as to grades, quality and areas, but as a rule is becoming generally firmer. All high grades continue firm at top prices. Old corrugated averages $28 per ton in New York, elsewhere quotations go as low as $20 and $23. One cut white envelopes are still $67.50. Soft white shavings from $43.00 to $57.50. Triple sorted, No. 1 brown soft kraft $50 for real quality paper. No. 1 heavy books and quality magazines $38.50.

Mills seem ready to absorb most all grades in good volume. Increased consumption by paperboard mills and building up of inventories by others for winter supplies accounts in large measure for the firmer tone.

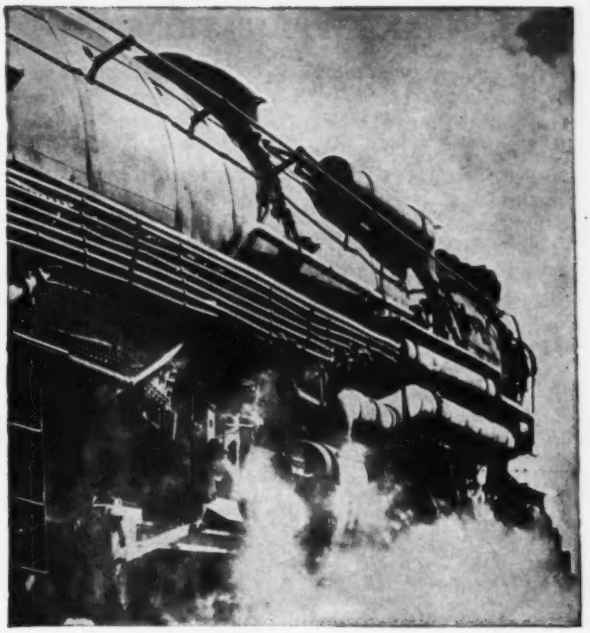
Ecusta Prepares New Air Mail Cost Chart

PISGAH FOREST, N. C.—Marking the forthcoming revision of the domestic air mail postal rate from 8 to 5 cents, Ecusta Paper Corporation has issued to its paper merchants from coast-to-coast, a tabulation showing the number of sheets of Ecusta Writing and Air Mail paper which could be air mailed for 5 cents. Tabulations were prepared with hair-line accuracy—including in the calculations the weight of the envelope, weight of the stamp and the normal variations in the weight of the paper as well.

According to Ecusta, the establishment of the 5 cent air mail rate will lead to new heights in the use of air mail. Business concerns will soon find it desirable to purchase letterhead paper adapted to three important functions — lightness for economical air mailing, distinctive enough to satisfy the demands of discriminating buyers and modern enough to meet the needs for all-purpose letter-head papers which will arise out of the new air mail rate change.

Ever Ready Advances Siegel

NEW YORK — Harry Siegel, who joined the staff of the Ever Ready Label Corporation last June as assistant advertising manager, has been appointed sales promotion manager.



YOU CAN'T GET POWER FROM LOST STEAM!

Steam—or any gas or liquid—leaking past a faulty gland or stuffing box . . . is lost for processing or as a source of power. The *wasted time* and *lost production* resulting from frequent replacement of improper or poor quality packing is a loss of much greater importance! That's why the use of "any packing that's handy" should be guarded against.

USE THE *RIGHT* PACKING!

PALMETTO makes the *right* packing for every one of your applications . . . the right quality for most economical maintenance . . . the right design for most effective sealing—with least wear to rods, shafts and stems.

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PALMETTO PALMETTO for steam, water, air. PELRO for oils. CUTNO for alkalis. SUPER-CUTNO (blue asbestos) for acids. KLERO for foods.

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Your Northwest will handle anything you have to lift or load. Pulp, lime, coal, ashes, cases or rolls are all in the day's work. From pulp yard to loading dock it can be kept busy all day long.

Diesel, gasoline or electric operation keeps the fire hazard down—no fires to bank—no steam, coal or water troubles! When the engine stops operating expense stops.

There is a size for every job—4 to 44 tons capacity. Plan for smoother yard operation in the future. What size are you interested in?

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NORTHWEST
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 28, 1946

BLANC FIXE—Demand currently reported as fair to good. Pulp is currently quoted at $40 per ton, in barrels, car lots, at works; the powder is currently quoted at $60 per ton, car lots f.o.b. works.

BLEACHING POWDER—Production hampered by climatic conditions, while drum shortage holds up shipments. Demand continues steady for domestic and export use. Quotations are unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums.

CASEIN—Prevailing prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 33 cents per pound; 2,000 pounds 33¼ cents per pound; less than 2,000 pounds; 33¾ cents per pound, f.o.b. shipping point. Sales at current ceiling on open billing effective August 15.

CAUSTIC SODA—Supplies inadequate to meet current heavy demand. Steel sheet shortage creates drum scarcity. Cutback production further reduces stock. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 to $2.95 per 100 pounds. All prices car lots.

CHINA CLAY—Fairly active demand reported with English grades plentiful. Quotations remain unchanged. Domestic filler clay is currently quoted at from $8.50 to $9 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $22 to $25 per long ton, ship side. All prices quoted in car lots.

CHLORINE—Stocks low with little improvement in container supply while demand continues steady. Quotations unchanged. Chlorine is currently quoted at $2.00 to $2.25 per 100 pounds, in single unit tank cars.

ROSIN—Savannah, Ga., quotations per 100 pounds in drums: B, $6.20; D, $6.27; E, $6.80; F, $6.90; G, $6.94; H to I, $6.96; K, $7.00; M, $7.02; N, $7.18; WG, $7.26; WW & X, $7.35. All prices in car lots.

SALT CAKE—Demand increasingly heavy while inventories grow lower. Prices remain unchanged. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots.

SODA ASH—Demand continues very heavy with no inventories on hand. Occasional resale lots. Boxcar shortage delays shipments. Orders allocated to equalize distribution. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.95; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Supplies continue below demand. Previous orders filled. Starch prices continue unchanged. The pearl grade is quoted at $5.87 per 100 pounds; powdered starch at $6.02 per 100 pounds; both prices in bags, car lots.

SULPHATE OF ALUMINA — Supplies moderate with demand reported active. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.20 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 to $2.00 per 100 pounds, in bags, at works.

SULPHUR—Strong seasonal demand is reported with stocks plentiful, shipments sometimes temporarily delayed. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $17.50 per long ton. Prices in car lots.

TALC—Domestic and French grades are moving in good volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $24 to $30 per ton.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March, 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	$74.00	@	—
Sheets	75.00	@	—
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard bag	*4.75	"	—

* Prices for Standard Wrapping are for 40 lb. base weight; for Standard Bag for 30 lb base weight.

Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00
Boards, per ton—			
News	*58.00	@	—
Chip	*58.00	@	—
Sgl. Mla. Ll. Chip	*65.00	@	—
White Pat. Coated	*79.00	@	—
Kraft Liners 50 lb.	*74.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper
Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@$15.50
No. 2 Glossy Coated	12.40 "	14.00
No. 3 Glossy Coated	11.60 "	13.25
No. 4 Glossy Coated	11.15 "	12.75
No. 1 Antique (watermarked)	10.25 "	11.75
No. 2 Offset	9.60 "	11.00
A Grade E. F.	9.35 "	10.75
A Grade S. & S. C.	9.60 "	11.00
B Grade E. F.	8.85 "	10.25
B Grade S. C.	9.10 "	10.50
C Grade E. F.	8.55 "	9.75
C Grade S. C.	8.80 "	10.00
D Grade E. F.	8.25 "	9.50
D Grade S. & S. C.	8.50 "	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers' Prices, Less Freight. Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$94.00
Unbl. Softwood Sulphite	82.00
Bl. Hardwood Sulphite	91.50
Unbl. Hardwood Sulphite	79.50
Bl. Glassine Sulphite	97.00
Unbl. Glassine Sulphite	86.00
N. Bleached Sulphate	94.00
S. Bleached Sulphate	88.00
N. Semi-Bleached Sulphate	89.00
S. Semi-Bleached Sulphate	83.00
N. Unbl. Sulphate	76.00
S. Unbl. Sulphate	69.50
Bl. Soda	84.00
Unbl. Soda	80.00
Groundwood	58.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$12.50
Lake Central	12.50
Southern	15.00
West Coast (in area)	9.50
West Coast (out area)	15.50

	50%-80% Air Dry Weight
Northeast	$10.50
Lake Central	10.50
Southern	13.00
West Coast (in area)	8.50
West Coast (out area)	14.50

Applying to Producers of Dry Wood Pulp.

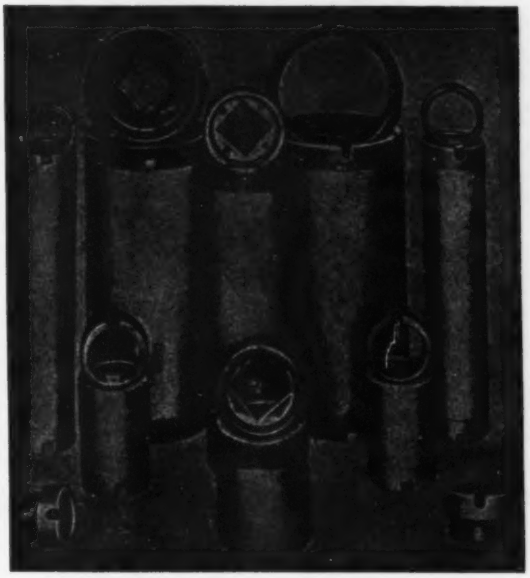
	Above 80% Air Dry Weight
Northeast	$7.50
Lake Central	7.50
Southern	10.00
West Coast (in area)	6.50
West Coast (out area)	12.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags
(Nominal Prices Delivered to Mill + 5% Brokerage)

Shirt Cuttings—		
New White, No. 1	7.25 @	Nominal
Silesias No. 1	5.75 "	"
New Unbleached	7.50 "	"
Blue Overall	5.50 "	"
Fancy	3.50 "	"
Washables	3.00 "	"
Bleached Khaki Cutting	4.25 "	"
Unbleached Khaki Cuttings	3.50 "	"



ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

Old Rags

White, No. 1—			
Repacked	3.80 @	Nominal	
Miscellaneous	3.20 "	"	
White, No. 2—			
Repacked	2.90 "	"	
Miscellaneous	2.65 "	"	
Thirds and Blues—			
Repacked	2.20 "	"	
Miscellaneous	1.30 "	"	
Roofing Rags—			
No. 1	1.55 "	"	
No. 2	1.45 "	"	
No. 3 (bagging)	1.35 "	"	
No. 4	1.35 "	"	
No. 5A	1.35 "	"	
Old Manila Rope	5.75 "	"	

Foreign Rags

(All Prices Nominal)

New Rags

New Dark Cuttings	6.00 @	Nominal
New Mixed Cuttings	6.50 "	"
New Light Silesias	5.75 "	"
Light Flannelettes	5.75 "	"
New White Cuttings	12.00-14.00	
New Light Oxfords		Nominal
New Light Prints	8.00-10.00	

Old Rags

No. 1 White Linens	8.50 @	Nominal
No. 2 White Linens	7.50 "	"
No. 3 White Linens	Nominal	
No. 4 White Linens	3.25 @	Nominal
No. 1 White Cotton	4.75 "	"
No. 2 White Cotton	3.75 "	"
No. 3 White Cotton	3.00 "	"
No. 4 White Cotton	2.20 "	"
Extra Light Prints	2.40 "	"
Ord. Light Prints	5.50 "	"
Med. Light Prints	4.75 "	"
Dutch Blue Cottons	Nominal	
French Blue Linens	Nominal	
Checks and Blues	4.00 "	"
Linsey Garments	4.00 "	"
Dark Cottons	3.60 "	"
Old Shopperies	3.35 "	"
New Shopperies	3.50 "	"
French Blues	Nominal	

BAGGING

(Prices to Mill, f.o.b. N. Y.)

Gunny No. 1—		
Foreign	4.00 @	Nominal
Domestic	3.30 "	"
Wool Tares, light	4.00-4.75	
Wool Tares, heavy	4.50 @	Nominal
Bright Bagging	3.50 "	"
Manila Rope—		
Foreign	Nominal	
Domestic	5.75 @	Nominal
Jute Stridgs	4.50 "	"
No. 1 Sisal Strings	3.00 "	"
Mixed Strings	1.50 "	"

Waste Paper

Nominal Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$67.50	@	—
No. 1 Hard White Envelope Cuts	62.50	"	—
No. 1 Hard White Shavings, unruled	57.50	"	—
No. 1 Hard White Shavings, ruled	50.00	"	—
Soft White Shavings, one cut	57.50	"	—
No. 1 Soft White Shavings	50.00	"	—
Soft White Shavings, Misc.	43.00	"	—
No. 1 Fly Leaf Shavings	33.50	"	—
No. 2 Fly Leaf Shavings	22.50	"	—
No. 1 Groundwood Fly Leaf Shavings	25.00	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	18.50	"	—
Mixed Colored Shavings	15.50	"	—
Mixed Groundwood Colored Shavings	18.00	"	—
Overissue Magazines	33.50	"	—
No. 1 Heavy Books & Magazines	38.50	"	—
Mixed Books	22.00	"	—
No. 1 White Ledger	46.00	"	—
No. 2 Mixed Ledger, colored	40.00	"	—
New Manila Envelope Cuttings, one cut	57.50	"	—
New Manila Envelope Cuttings	53.00	"	—
Extra Manilas	39.00	"	—
Mixed Kraft, Env. & Bag Cuttings	55.00	"	—
Kraft Envelope Cuttings	65.00	"	—
Triple Sorted, No. 1 Brown Soft Kraft	50.00	"	—
New 100% Kraft Corrugated Cuttings	45.00	"	—
No. 1 Assorted Old Kraft	35.00	"	—
New Jute Corrugated Cuttings	18.50	"	—
Old 100% Kraft Corrugated Containers	35.00	"	—
Box Board Cuttings	14.50	"	—
White Blank News	33.00	"	—
Overissue News	22.00	"	—
No. 1 News	20.00	"	—
No. 1 Mixed Paper	19.00	"	—
Old Corrugated	28.00	"	—
Mill Wrappers	22.00	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.26	@	—
White Hemp	.26	"	—
Fine Polished—			
Fine India	.31	"	—
Unpolished—			
Box	.20¼	"	—
Paper Makers	.20	"	—
Tube Rope	.22	"	—
Wall Paper	.23½	"	—
Wrapping	.26	"	—
Soft Fiber Rope	.22	"	—
Cotton	.28	"	—
(Hard Fiber)			
Medium Java	.23	"	—
Mex. Sisal	.21	"	—
Manila	.33	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¾

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean Bright—			
Sisal Strings	.04	"	—
No. 2 Clean Bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¾	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

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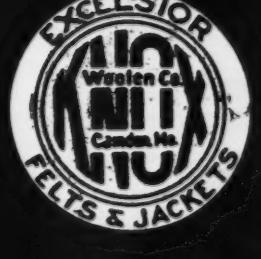

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Manufacturers of Felts of Superior Quality
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KNOX WOOLEN COMPANY
CAMDEN MAINE

The CLEARING HOUSE

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.
SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ⅓ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.
WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.
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PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

Copy for Classified Advertisements must be in our office on Monday preceding publication

HELP WANTED

Superintendent — Mechanical Engineer preferred—to take charge of large Paper Bag Manufacturing Plant in N. Y. City. Prefer man who has had experience in this line. Age 35 to 45 years. Must be capable of handling labor, etc.
State qualifications and salary required. Excellent future for right man.
Address Box 46-462 care Paper Trade Journal. S-5

WANTED

Tour Boss, Machine Tenders, Back Tenders, Third Hands, familiar with manufacturing toilet, napkin, facial tissue, in an Eastern mill. Reply to box—46-456 care Paper Trade Journal. S-12

SALARIED POSITIONS

$2,500-$25,000. This thoroughly organized confidential service of 36 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg., Buffalo 2, N. Y.

PROCESS ENGINEER
Wanted

With wide experience in pulp and paper making processes. Must be able to develop flow diagrams and specify related equipment. Excellent opportunity for the right man. Please furnish complete experience record.
Address Box 46-261 care Paper Trade Journal. TF

Wanted—Paper man, 22 to 35, with production or technical experience, for sales-service work. Box No. 46-581 care Paper Trade Journal. S-12

WANTED WEAVING ROOM SUPERINTENDENT—to directly supervise all of the work of weaving and finishing special fabrics made of paper yarn, and to have charge of pattern design and manufacturing processes for a well-established business, located in an exceptional city of a north central state. Applicant must have a combination of a technical and practical experience, plus the ability to handle people, and a friendly but strong personality that will assure his success and worthiness of this excellent opporunity. State training, experience, references and salary expected. Address Box 46-594 care Paper Trade Journal. S-12

HELP WANTED

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel

Positions Now Open
Superintendent fibre board, to take charge of operations, wet cylinder machines, New England
Millwright, New England
Beater engineer, rag bonds
Mechanical Engineer
Development machine shop supervisor not over 45 years old
Tour boss, folding box board
Sales engineer up to $350 month
Technical control chemist

We invite correspondence (strictly confidential) with paper and pulp mill executives seeking new positions and with employers seeking new personnel. A-29

WANTED
TOUR BOSS

Experienced in Roofing Felt Mill operations, to be trained for Assistant Superintendent job in New Orleans Plant of long established nation-wide organization. Send complete resume giving experience, education, salary expected, etc., to Box 46-605 care Paper Trade Journal. S-5

$6,000 to $10,000 annually for Paper Mill Engineers who can qualify.

(a) Operations and process engineer with technical plant experience in general paper and board plants.

(b) Engineer and project man capable of coordinating the design and construction of paper and board making facilities including writing specifications and purchase of equipment. Experience with consulting engineer highly desirable.

Give complete details in first letter including age, education, record of experience and earnings. Salary expected, when available for interview. Box 46-582 care Paper Trade Journal. S-12

WANTED—Plant Engineer to take charge of steam and electric power and general maintenance for a New England pulp and paper mill producing over 100 tons of fine papers per day. All members of our organization know of this advertisement. Address Box 46-552 care Paper Trade Journal. A-29

SUPERINTENDENT — Experienced specialty bag plant Philadelphia vicinity. Replies confidential. Address Box 46-570 care Paper Trade Journal. S-5

HELP WANTED. Chemist or Chemical Engineer with experience in paper machines, sizing, coatings, etc. to work on research and development for chemical manufacturer. Send full particulars of age, experience, education, date available and salary desired. Address Box 46-578 care Paper Trade Journal. A-29

ASSISTANT SUPERINTENDENT of maintenance with paper mill experience, knowledge of power and electricity necessary. Must be college graduate. Give full information including experience and age. Address Box 46-588 care Paper Trade Journal. S-12

WANTED—Tour Boss experienced on folding grades. Good salary plus a bonus. Address Box 46-528 care Paper Trade Journal. A-29

WANTED—TOUR BOSS for prominent New England Mill with two board machines, manufacturing high grade folding box board. Permanent position. Write, giving age, qualifications and salary expected in first letter. Address Box 46-521 care Paper Trade Journal. TF

WANTED—Cylinder Machine Tender familiar with folding grades. Good hourly rate plus a bonus, with opportunity for advancement. Address Box 46-529 care Paper Trade Journal. A-29

HELP WANTED

WANTED—Master Mechanic for one Machine Mill making folding grades. Excellent opportunity for right man. Good salary plus a bonus. Address Box 46-527 care Paper Trade Journal. A-29

WANTED — Progressive Mill with expansion program under way is in need of a man familiar with the receiving and handling of paper stocks and pulps used in the manufacture of folding boxboards. Excellent opportunity for the right man. Address Box 46-526 care Paper Trade Journal. A-29

GRADUATE ENGINEER with Paper Mill and Steam experience wanted. Good opportunity with growing company. Address: Ward Paper Company, Merrill, Wisconsin. S-5

SUPERINTENDENT for specialty bag plant, Philadelphia vicinity, good opportunity for the right man. Replies confidential. Address Box 46-570 care Paper Trade Journal. S-5

WE HAVE an opening for an Operating Control Chemist and also for a Research Chemical Engineer for independent research work on paper products. All inquiries will be held in strict confidence if so desired. Address: Ward Paper Company, Merrill, Wisconsin. S-5

WANTED — PLANT ENGINEER for large paper mill located in northern New England. Practical maintenance experience desirable. Apply stating age, experience, education and salary expected. Address Box 46-599 care Paper Trade Journal. S-5

CHIEF CHEMIST—or Technical Control Director for light weight tissue mill. New York State. Excellent opportunity. Our employees know of this ad. Replies confidential. Address Box 46-600 care Paper Trade Journal. A-29

CHIEF ENGINEER—Manufacturer for light weight tissue mill in New York State. Excellent opportunity. Our employees know of this ad. Replies confidential. Address Box 46-601 care Paper Trade Journal. A-29

WANTED—For Technical Sales, a Chemist with practical experience in the sizing and coating of paper. Address Box 46-602 care Paper Trade Journal. S-5

SITUATIONS WANTED

Superintendent of Paper Mill interested in making new connection. Practical experience for twenty-three years in the manufacture of rope, jute and sulphite and sulphate specialties. Experienced in both cylinder and fourdrinier machines. Understands manufacture of insulating papers high grade bristol board, tag stock and milk bottle cap stock and other high grade specialties. Address Box 46-598 care Paper Trade Journal. S-5

MILL REPRESENTATIVE covering the jobbing and direct trade for the past 15 years from Pennsylvania through to the Carolinas, now desires to operate over the same territories with 2 or 3 non-conflicting lines. What have you to offer? Address Box 46-412 care Paper Trade Journal. TF

POSITIONS WANTED—General Superintendent wishes to make change. Expert on ground wood and sulphite specialties. Book, Bond, Ledger and Cat. 19 to 100# and machine coating. Also beater and coating colors. Will go anywhere at once. Age 44. Well up on technical control. Address Box 46-579 care Paper Trade Journal. S-12

PRACTICAL WORKING MASTER MECHANIC—General all around machinist and millwright. 35 years experience—15 years in Paper Mills. Trade school education. Metropolitan area of New York City or Philadelphia, Pa., preferred. Address Box 46-559 care Paper Trade Journal. S-5

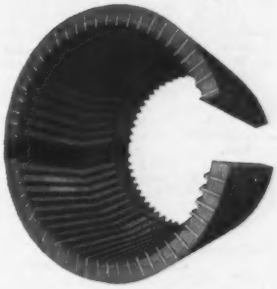
No. 6 MIAMI JORDAN

The engineering that makes the "ten-strong" Miami line of jordans the most widely used line, several times over, should interest superintendents and mill mechanics everywhere. So, here are some design high points on just one—the No. 6.

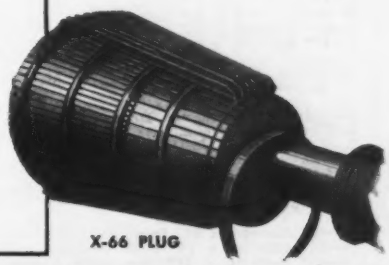
- **One-piece body and base.**
- **Bearing fits, taper bore, packing box fits—all machined at one setup.**
- **Easily demountable.**

Fill a No. 6, or any of the other nine, with a Bulldog shell filling and a rugged X-66 plug and you have an unbeatable jordaning combination.

ADDRESS *SHARTLE* ON JORDANS



BULLDOG FILLING



X-66 PLUG

Stock Preparation Systems	X-66 Plugs	Propeller Agitators	Waxing Machines
Hydrapulpers	Bulldog Fillings	Agi-flo Agitation	Water Finish Attachments
Hydrafiners	Selectifier Screens	Pumps	Valves—many types
Hydracycle Tanks	Hi-Speed Beaters	Waste Paper Systems	Steamfits, Syphons
Miami Jordans	Breaker Beaters	Chests—all kinds	Paper Machines
Flex Couplings			Drives, etc.

SHARTLE Dilts

THE BLACK-CLAWSON CO.
HAMILTON, OHIO

Divisions:
SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO
DILTS MACHINE WORKS, FULTON, N. Y.
Associate:
ALEXANDER FLECK LIMITED, OTTAWA, ONT., CANADA

SITUATIONS WANTED

SITUATIONS WANTED

GENERAL SUPERINTENDENT

SOUTHERN KRAFT

25 years experience both pulp and paper

Presently meeting specifications on ASPHALTING, CEMENT SACK, SATURATING and other converting grades. Available on 60 days notice. Salary $12,000. Address Box 46-597 care Paper Trade Journal. S-19

CHEMIST—Research, control, development. 8 years experience. Young, family, willing and conscientious worker. Employed, not looking for just another job but THE JOB. Background of coating, sizing and adhesives work with vegetable protein and resinous materials. Interested in development or production job of responsible nature. Address Box 46-557 care Paper Trade Journal. A-29

PAPER MAKER and MECHANIC—Twenty-six years experience operating, maintenance and installing, cylinder, fourdrinier their auxiliary and converting equipment. References. Address Box 46-549 care Paper Trade Journal. S-5

SUPERINTENDENT—Practical Paper Maker with engineering background. Capable of producing cylinder grades from Plain Chip to Bristols and can revamp or start off new mills. Address Box 46-544 care Paper Trade Journal. A-29

RESEARCH ENGINEER with years of valuable experience in pulp, paper, board, specialties and mill equipment is available for responsible job in production or technical direction. Address Box 46-558 care Paper Trade Journal. A-29

MECHANIC — Erecting, reconditioning fourdrinier and cylinder machines, auxiliary and converting equipment. References. Address Box 46-550 care Paper Trade Journal. S-5

MANY YEARS EXPERIENCE as Chemist and Superintendent in web printing (rotogravure and letterpress) and fancy coated paper plants. Address Box 46-592 care Paper Trade Journal. S-5

SUPERINTENDENT—30 years experience in paper towels, napkins and toilet tissues. Can furnish the best of references. Available at once. Address Box 46-547 care Paper Trade Journal. S-5

SITUATIONS WANTED

INSTRUMENT ENGINEER desires position as staff instrument engineer with a large pulp and paper mill. Graduate engineer with eight years experience in process instrumentation. Two years directly connected with the pulp and paper industry. Address Box 46-567 care Paper Trade Journal. S-5

INDUSTRIAL ENGINEER—Wide experience in manufacture and development of specialties for shoe, electrical, sanitary container and other converting industries. Desires position part or full time basis. Address Box 46-584 care Paper Trade Journal. S-5

FOR SALE

FOR SALE

New brass covered felt or wire rolls 6¼" dia., 84 to 120" face. These are made from government surplus and are new in all respects.

Osborne Paper Mill Equipment Co.
Fulton, N. Y. TF

FOR SALE—50" Sheridan New Model Cutter in good working order. Address Box 46-606 care Paper Trade Journal. A-29

FOR SALE

BEATERS

1—2000 lb. Holyoke-Iron Tub Beater.
2—1200 lb. E. D. Jones (no tubs).
1—1000 lb. Dayton Beater (no tub).
1—1000 lb. Stout & Mills Iron Tub Beater.
1—400 lb. Gavit—iron tub beater.
1—Breaker Beater—Dilts Bandless Roll 62" diameter x 54" face—70 tons daily capacity. Equipped with Shartle Bros. Ragger.
1—Breaker Beater—New Perforated Backfall—48" face roll x 54" diameter—no tub.

CALENDER STACKS

1—5 roll 84" face—Farrel.
1—6 roll—72" face.
1—7-roll 36" Holyoke Machine. (supercalender)

CENTRAP

1—Shartle Brothers Centrap.

COATING MACHINES

1—70" Waldron Brush Coater.
1—26" six roll coating machine.

COUCH ROLLS

2—82" face x 12" diameter.

CYLINDER MOULDS

1—30" diameter x 74" face.
2—30" diameter x 54" face.
1—30" diameter x 75" face.
1—36" diameter x 84" face.

DOCTORS

14—Dillon Doctors—complete with accessories—98" face.

DRIVES

4—Smith & Winchester Drives.
1—Moore & White mortise gear drive.
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
7—D. O. James Angle Drives—11 to 1—12 to 18 h.p.

DRYERS

1—48" diameter x 94" face.
1—24" diameter x 84" face. (Baby)
3—36" diameter x 64" face, with frames gears and bearings.
2—25" x 120" (Baby Dryers).
1—30" x 120".
1—48" x 100".
11—30" x 80". (Steel Dryers).
5—24" x 76". (Steel Dryers).
2—36" diameter x 38" face.

ERKENSATORS

2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS

1—12 plate Murray Dunbar Flat Screen.
1—4 plate Flat Screen.

HYDRAFINER

1—Shartle Bros. Hydrafiner.

JORDANS

1—No. 2 Miami Jordan.
1—No. 9 Emerson Jordan—for direct connection to a motor.
1—Noble and Wood, Monarch, new fillings.

LABORATORY EQUIPMENT

2—Mullen Testers.

MOTOR

1—25 h.p. motor, including starting equipment.

PRESS ROLLS (Rubber Covered)

1—27½" diameter x 186" face.
1—26" diameter x 185" face.

PULP EQUIPMENT

1—32" three pocket Glens Falls Grinder (for 27" wood).

PULP SCREEN

1—IMPCO centrifugal pulp screen design No. 3.

PULPER

1—Jones Pulper.

PUMPS

1—10 x 11 Connersville Vacuum Pump.
1—10 x 7½ Connersville Vacuum Pump.
1—No. 4 Connersville Vacuum Pump.
1—6 x 2L Connersville Vacuum Pump.
1—No. 7 Sturtevant Vacuum Pump.
1—Buffalo Pump—5500 g.p.m. direct connected to 100 H.P. Motor (50' head).
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

RAG CUTTER

1—Taylor Stiles, 14", Little Giant.

REDUCERS

3—Westinghouse Gear Motors—25 h.p.—115 output r.p.m.—3/60/440.
1—Master Gear Motor—15 h.p.—193 output r.p.m.—3/60/220-440.
1—Master Gear Motor—10 h.p.—153 output r.p.m.—3/60/220-440.

REELS

1—72" Downingtown Expansion Reel.
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—110" face.
1—Set Stack Reels, capacity trim 143".

ROLLS

500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

ROTARY SCREENS

4—#2A Bird Rotary Screens, Copper Vats, with motors.
3—Moore & White Rotary Screens (alternating diaphragm type).

SAVEALL

1—Saveall 36" diameter x 96" face cylinder mold. (With iron end vat.)

SCREW PRESS

1—Valley Iron Screw Press.

SCREEN PLATES

36 plates—43 x 11 1/16"—.050 cut—bevel edges.
24 plates—Recently recut .008.
12 plates—Recently recut .035.
Also other sizes and cuts in stock.

SHREDDERS

1—No. 25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder.
1—Waterville Shredder.

SHEETERS

1—84" Finlay Sheeter, Erie Layboy and 9 roll backstand.
1—128" Moore & White Sheeter with layboy.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SLITTERS AND WINDERS

1—52" Johnstone Slitter & Winder.
1—36" Beck Razor Blade type Slitter & Winder.
1—60" Moore & White Slitter and Winder set for 5/8" slits.
1—60" Moore & White Slitter and Winder set for 7/16" slits.
1—120" Moore & White 4 drum slitter.
1—80" 2 drum Warren Winder.

STOCK PUMPS

1—12 x 20 Triplex Shartle.
1—10 x 20 Duplex Shartle Brothers.
1—10 x 12 open impeller. (All lead).
Numerous other Centrifugal Stock Pumps. Advise as to your requirements.

SUCTION BOX

1—Nash 100" face Suction Box.

V-BELT DRIVES

1—{23" diameter x 14" face, 10 grooves.
{15" diameter x 14" face, 10 grooves.

WET MACHINE

1—74" Moore & White.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?
Wanted Cylinder and Fourdrinier Machines (complete mills).

J. J. ROSS COMPANY

250 Frelinghuysen Ave. **Tel.—Bigelow 3-3720** **Newark 5, N. J.**

TELEPHONE
HUMBOLDT 2-2177

CABLE ADDRESS: JACK ROSS

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING
PAPER MAKING EQUIPMENT

NEW, USED, REBUILT
PAPER AND PULP MACHINERY

1—Shartle Brothers 2 cylinders—120" machine. (Can supply four additional cylinders and vats). Machine includes:—2 pairs of baby presses, 3 pairs of primary presses, 2 pairs of main presses, 27 dryers 36" diameter x 115¼" face—3 deck—spare cylinder mould and couch. Drives, stands, line shaft and pulleys. Blue prints available.

1—Farrel Birmingham 16" Asphalt Extruder Complete.—Used 7 months.

AIR HOISTS
2—Two-Ton Ingersoll Rand
2—Five-Ton Ingersoll Rand

BEATERS
2—1000 lb. Horne Iron Tub.
1—1200 lb. Holyoke Wood Tub.
2—Valley Iron 750 lbs. Iron Tub Beaters, with Silent Link Belt Drive.
2—2000 lb. Valley Iron with wood tubs—like new.
1—1200 lb. Noble and Wood—no tub. Spare new fillings 4 roll.

BIRD SCREEN PLATE
17 Plate—60 cut. New condition.

BLEACHERS
2—Bertram high tensity bleachers—used 3 months.

BLOWERS
1—American ball bearing blower, size 17" x 23" for motor drive.
1—American Blower, size 40. For belt drive.

CALENDER DOCTORS
1 set of 16 Warren Doctors 104" face with frames.
60 Warren Doctors—various sizes.

CALENDER ROLLS
30 rolls various sizes

CALENDER STACKS
1—6 roll Beloit, 110" face.
2—2 roll Holyoke 36" face.
1—9 roll Moore & White—82" face.

CONVERTING EQUIPMENT
4—Sanitary Napkin Machines. With motors and starters.
1—Bliss Double Head Stitcher.
4—Waterville Grinders.

CREPING MACHINE
1—Complete Bagley & Sewall Creping Machine. Dryer 100" face x 48" diameter. Ball bearing equipped. Used 6 months.

CYLINDER MOLDS
3—Impco—84" face—40" diameter with stainless steel face wire
2—110" face x 36" dia.
1—90" face x 36" diameter—with ball bearings and cast iron end vats.
4—94" face x 36" diameter.
4—Cylinder Molds—cast iron end vats—cylinders 120" face x 36" diameter. Ball bearing.

DANDY ROLLS
2—122" face 10" dia.
1—138" face 12" dia.
1—129" face 9½" dia.

DRIVES
1—Falk 25 h.p.—7.5 to 1.—1750 r.p.m.

DRYER DOCTORS
40—Warren Doctors. Various sizes.

DRYERS
38—48" Dia. x 46" Face, Chromium Plated.
2—24" Dia. x 46" Face.

ELECTRIC HOIST
1—Sprague Electric 3 ton hoist—5 h.p. 3 phase —60 cycle—110 volts.

FLAT SCREENS
1—8 plate Sandy Hill Packer—roller shoes.
1—10 plate Packer screen with scraper.
1—Sandy Hill 2 plate flat screen.

FOURDRINIER SHAKES
1—Beloit Fourdrinier Shakes.
1—Sandy Hill Bertram Shake. Late type.

FOURDRINIER WET END
1—120" Beloit Fourdrinier Wet End.
1—74" Pusey & Jones Wet End.

GRANITE ROLLS
2—112" face 20" diameter.

HAMMERMILLS
1—American Hammermill—37" anti friction bearing equipped.
1—Jeffrey Swing Hammer size 18"x24"—Type A.
1—Williams 18" Hammermill Ball Bearing.

HOG
1—Mitts & Merrill Hog. Number 5252.

JORDANS
2—E. D. Jones Majestic Jordans, with one new set of fillings for both plugs and shell—belt drives.
2—#2 Miami Jordans—motor driven.
2—E. D. Jones Imperial Jordans—belt driven.

MISCELLANEOUS
2—Nugent Oil Filters (new).
1 Shartle Brothers cast iron Riffler or Settling Trough. 72" long, 6'7" wide.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face.

PULLEYS
60—Cone Split and Solid Cast Iron Pulleys. Various Sizes.

PULP SCREENS
4—Wells Screens.
6—Trimbey Screens.

PULP EQUIPMENT
1—120" face Kamyr Press.
1—84" Sumner Disc Barker with motor.

PULPERS
1—Voith Pulper 20 tons cap.
1—Bird Pulper.

PUMPS
4—Worthington Pumps 10,000 g.p.m.—35' head. Requires 75 h.p. at 530 r.p.m.
1—DeLaval 6" x 6".
1—DeLaval 1800 g.p.m. 30' Head. 500 r.p.m.—8" Suction—10" Discharge. Ball Bearing—Belt Driven—or for Direct Connection to Motor. Open Impeller.
11—Worthington Close Coupled Centrifugal Pumps. 6" x 6" 650 g.p.m. 25' head. 6 h.p. Star Electric splash proof motor. 1750 r.p.m. 440 volt, 3 ph.-60 cycle, ball bearing.
16—Warren Vertical Pumps. 6" suction. 3" discharge. 135 g.p.m. 80' head. Direct Connected 6 h.p. General Electric motor. 1750 r.p.m. 440 volts, 3 ph.-60 cycle, ball bearing.
1—Warren Close Coupled Centrifugal Pump. 3" suction. 2" discharge. 60 g.p.m. 90' head. 6 h.p. General Electric 1750 r.p.m. 440 volts, 3 ph-60 cycle, ball bearing. All the above pumps and motors are in excellent condition and are of bronze construction.
2—Worthington 3". 2 stage, 200 g.p.m. 224' head. Bronze Ball Bearings.
1—Worthington 400 g.p.m. 35' head 1750 r.p.m. Ball bearing.
1—15" Buffalo—4000 g.p.m.—70' head. For direct connection to motor.
2—La Bour Company self priming ball bearing pumps. 2½" suction. 2½" discharge. 150 g.p.m.—30" head with extended base for motor.
1—Domestic Pump ball bearing—250 g.p.m., 4" suction, 3" discharge—30' head with extended base for motor.
1—Mario ball bearing pump—420 g.p.m.—100' head. 4½" suction. 3" discharge. With extended base for motor.

REELS
1—Black-Clawson 2 Bowl—120" face. Takes 50" diameter roll.

ROLLS
40—Table, Dress, Felt, Wire, Breast and Calender Rolls. Various Sizes.

ROTARY COOKER
1—Rotary Cooker—6' dia. x 21' long—complete with drive.

ROTARY SCREENS
2—#2 Bird with copper vats.
2—#1 Bird with steel vats, lead lined.
4—Moore & White.

RUBBER PRESS ROLLS
1—185" Face—26" Diameter } Used 20 Days
1—186" Face—27½" Diameter }
1—119" Face—19½" Diameter.
1—109" Face—17½" Diameter.
1—120" Face—19" Diameter.
1—118" Face—18" Diameter.
1—129" Face—18" Diameter.
1—107" Face—18" Diameter.
1—106" Face—18¼" Diameter.

SAVEALLS
1—A. D. Wood cylinder 48" dia. 60" face.

SCREW PRESS
1—Valley Iron Screw Press. Used 2 years.

SHEETERS
1—90" Beloit Single Knife heavy duty.

SHREDDERS
2—24" Sprout Waldron heavy duty shredders—anti friction bearing equipped.
1—Taylor Stiles Portable Pulp Shredder—on wheels.
1—Rythor and Pringle Shredder.

SLITTERS AND WINDERS
82" Warren two drum—fully rebuilt.
1—41" Waldron Slitter and rewinder. Roll embossing attachment.

STUFF PUMPS
1—12" x 20" Shartle triplex.
2—4" x 10" Shartle Duplex direct connected to 3 h.p. gear head motors.

SUCTION BOXES
4—Brass Suction Boxes—110" face—8" wide—adjustable.
1—Brass Suction Box—120" face—8" wide—adjustable.

SUPERCALENDER STACKS
1—7 roll Norwood 72" face; 4 paper and 3 iron rolls. 1 new spare paper roll.
1—7 roll Norwood 52" face; 3 paper and 4 iron rolls. 1 new spare paper roll.
1—9 roll Norwood 83" face. Bottom roll 24" diameter. Top roll 20" diameter.

TURBINES
2—General Electric Turbine Paper Machine Drive 250 h.p.—350 r.p.m. 125 lb. steam pressure. 30 lb. back pressure.

UNWINDERS
1—42" John Waldron Unwinder. Used 1 year.

VACUUM PUMPS
3—14" x 20" Connersville.

WET MACHINES
1—76" Pusey & Jones Cylinder Mould, 76" face —38" diameter with rubber couch. 16" dia.
2—Glens Falls 84" Wet Machines—cylinder mold 48" diameter with 18" rubber couches.
2—Glens Falls 84" Wet Machines—cylinder mold 36" dameter with 18" rubber couches.

YANKEE DRYERS
2—Beloit 8' dia. x 175" face—75# working pressure.
1—Beloit 5' dia. x 194" face—75# working pressure.

THE ABOVE IS A PARTIAL LIST OF EQUIPMENT OFFERED FOR SALE.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

We buy single items to complete Pulp and Paper Mills.

FOR SALE

REVAMPING AND REBUILDING MILL AND CAN OFFER FOR SALE

1—Noble & Wood Mammoth Jr. Jordan ¼" Filling. Now operating.
1—Brass covered finishing press roll—17¾" diameter x 89½" face.
1—4000# Capacity motor driven freight elevator with automatic stop control—can be inspected in operation at our plant.
1—6" Lawrence Centrifugal Water pump.
2—8" Barnes Centrifugal Sewage Pumps.
8—100" Screen plates for No. 2-A Bird Screen. Slots. .022—never used after being recut once.
1—Rubber covered press roll 12" diameter by 68" face—Journals 5" diameter by 7¼" long.
1—Rubber covered press roll 12" diameter by 84½" face—Journals 5" diameter by 7¼" long.
1—20" face cast iron tapered pulley—2 15/16" Bore, Taper, 31"-29½".
2—20" face cast iron tapered pulley—3 7/16" Bore, Taper 31"-30".
1—24" face cast iron tapered pulley—3 7/16" Bore, Tapered 31⅝"-29⅝".
2—Steel split pulleys 60" diameter by 31" face —5 15/16" bore.
1—Cast iron split pulley—60" diameter by 21" face by 3½" bore.
1—Cast iron split pulley—40½" diameter by 21" face by 3½" bore.
1—Cast iron split pulley—84" diameter by 36" face by 5 15/16" bore.
1—Cast iron split pulley—72" diameter by 19" face by 10" face by 8⅝" bore.
2 —Steel split pulleys—60" diameter by 41" face by 5 15/16" bore.
1—Paper pulley—24" diameter by 21" face by 4½" bore.
1—Tapered cast iron split pulley. Taper 30" to 20½" by 20" face by 3 15/16" bore.
1—30" x 90" Cylinder mould—7" diameter shaft inside cylinder.
1 9½" diameter x 85" Face Rubber-covered squeeze or wringer roll-Journals 1 15/16" diameter.
1—9" diameter x 88" Face Calender roll—5" diameter journals.
12—6½" dia. x 92" face steel drier felt rolls with 1 7/16" x 6½" Journals.
2—4" Gould centrifugal stock pumps with 2 vane open impeller. Capacity 600 G.P.M. at 40' head—1175 R.P.M. with 10 H.P. Open-sided less than two years.
2 —Pair Noble & Wood lighter stands complete with lighter beams and bearings for 8" diameter journal beater roll.

A visit to the mill would prove profitable as we have many items for sale too numerous to mention. See our superintendent, Mr. O. P. Fussell at our plant in Walloomsac, N. Y.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, N. Y. TF

1—30" late type Model "B" Fales Slitter & Rewinder.
1—30" Late type Model D Fales Slitter and Rewinder equipptd with knife setups to cut following widths: ¼, 9/32, 5/16, 11/32, ⅜, 13/32, 7/16 and ½ inches.
1—58" Type 40B Hudson Sharp Toilet Paper Converter. Perforates 5" lengths toilet or 10" paper towels.
1—64" Creping Machine. Creping roll 12" in diameter with doctor blade. Two dryers 36"x64" and rewind.
6—S.O.S. Grocery Bag Machines making 1 lb., 2 lbs., 3 lbs., & 10 lb. each, and one making 7 & 8 lb. bags.
1—65" wide single face corrugating machine. Complete, good condition.
1—92" Dillon Duplex Rotary Sheet Cutter Equipped with 25 roll triple deck back stands and Brennan Folder.
1—Noble & Wood 100 lb. Experimental Beater.
4—Complete spiral tube winders with automatic cut-offs, also recutter. 2 Langston and 2 Knowlton manufacture.
1—84" #9E Hudson Sharp Unit Embossing Section for use with toilet paper converter. Complete with 2 steel engraved rolls, "basket weave" and "ribbon" patterns.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y. TF

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore 30, Md. TF

FOR SALE

FRANK H. DAVIS CO.,
ESTABLISHED 889
USED AND REBUILT PAPER MACHINERY.

FOR SALE

BARKERS
1—48" Waterville
BEATERS
1—Horne Patent, Roll 60x60, bronze bars
2—52x52 Downingtown iron tub
1—44x44 Horne iron tub
CUTTERS
1—110 Hamblet Duplex: 53" Hamblet—2 Whitin Foil Cutters
1—84" Clark with M. & W. Layboy 1—63 Beloit
1—Taylor style Rag Cutter
1—S & W 63" "Undercut" Ream Cutter
DECKERS
1—30"x95" B & C and 1—48"x100" Improved
DRYERS
1—6'x86", 1—6'x102", 106' and 106"
2—8'x175", 1—5'x194", new 1939
JORDANS
2—Union Standard for motor drive
1—N O W Pony Monarch: 1 Claflin #2
FANS
2—Buffalo double Turbo 6½ Coneidol forced draft fans
FOURDRINIER PARTS
22000 C F M 6" state pressure
1—R S O F wire 100x31 rebuilt
1—P & J wire 133x61"2" now running at 500 F P M
LOCOMOTIVE
1—Alliance also 7000 feet of 60 lb. track with connections
MIXER AND COOKER
1—25 gallon cooker #75
PULPERS
2—Jones with Talk Reducers and motors 440 volts, 3 phase 60 cycle
1—Lannoye #2
SCREENS
2—Moore & White #2: 1 Listhwalk
2—6 plate—6—12 plate and 6 new 14 plate, flat
SHREDDERS
2—Mitts Merrill #15 C.F. direct cont. to 125 H.P. 440 v. Motor
1—Waterville: 1—Carthage: 1—Rythar & Pringle: Mitts Merrill type 14A P E S #C 19026—12—44 never used.
SLITTERS
1—26" Kidder 2 drum
1—114 N. & W. 4 drum winds 60" roll
WASHERS
2—2000 lb. Union Mach. Steel tubs Cal. 1—32" Textile Super Cal.
WINDER
1—50" Cannard
PUMP
1—10x10 Beloit Triplex stuff.

Builders of
ASPHALT COATING, COMBINING MACHINE, GUMMING AND CREPING MACHINE, ROLL GRINDER
FRANK H. DAVIS COMPANY
175 Richdale Ave., Cambridge, Mass. A-22

FOR SALE—45" Hamblet Paper Sheeter complete with roll stand, 5 h.p. motor and Layboy. $3000.00 FOB Seattle. WEST COAST PAPER COMPANY, 414 Holgate St., Seattle, 4, Wash. A-29

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Complete sold fibre paster up to 4 plys 62" wide with or without paper lining stations; Miehle 46" printers and die cutters; Seybold 28"x38" heated embosser; International window cello. Gluer model CC; 36"x48" rotary printers; Waldron 64" rewinder; 63" and 76" Langston cut-off knives; 48" Meisel spot sheeter with Erie layboy; 64" Hamblet sheeter; 62" Beloit board sheeter; 72" and 96" hand board cutters; Sheridan 44"x64" and 80"x70" 4-post die cutters; Hayssen heat seal wrappers; S.A.M. folding box gluer; 45" and 120" Rotary Board Slitters. Also coaters, waxers, embossers, paper cutters, printers, gummers, gluers, creasers, scorers, trimmers, slitters and rewinders, slotters, die cutters, and stitchers. Write for bulletins listing over 70 paper converting and paper box machines now available.

SOUTH WABASH ENGINEERING CO.
2929 S. Wabash Ave., Chicago 16, Ill. S-5

FOR SALE

FOR SALE

Barrett - Craven and Lewis - Shephard Lift Trucks, in excellent condition, 3,500# and 5,000# capacities, 7" high in lowered position, 3" and 4" lifts.

EMPIRE BOX CORPORATION
Garfield, New Jersey
TF

FOR SALE
DEINKED PULP
Address Box 46-542 care Paper Trade Journal. S-5

PAPER MILL EQUIPMENT
For Sale

110" Hamblet heavy duty mill type Sheeter.
30" Finley Sheeter.
36" Langston Slitter.
44" Chandler & Price Automatic Cutter.
54" Oswego hand clamp Power Cutter.
2—14 x 22 John Thomsons.
36" Waldron Reel.
American heavy duty Cross-Cut Saw.
NEW BALING PRESSES, hand & power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18

FOR SALE
BREAKER BEATER

1—Dilts Bandless Roll 62" diameter x 54" face—70 tons daily capacity.
Equipped with Shartle Bros. Ragger.
1—Appleton Breaker Beater—New Perforated Back Fall — Beater roll 48" face x 54" diameter. (Newly Filled)—No tub.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Tel. Bigelow 3-3720 A-22

PAPER COATING MACHINERY — Waxing, Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

FOR SALE—One 38" two color Rotogravure Press. Sheet feed and pile delivery. Practically new. Address Box 46-541 care Paper Trade Journal. S-5

FOR SALE—Moore & White Style K.T. Duplex Cutter with one Revolving Duplex Slitter having 94" length of knives and three each top and bottom Slitters on each of two slitter shafts and with a two reel unwinding backstand. Ready for immediate shipment. Theo. Adams, 111 West Washington St., Chicago, 2, Ill. A-29

FOR SALE

2—new Nash K-7 vacuum pumps
1—Shartle 15" centrifugal pump, 5300 GPM, 55' head
2—new Black-Clawson 10 x 8 fan pumps
1—Frederick centrifugal pump, 2500 GPM, 90' head, turbine driven.
1—Hayton 6¾ x 10 triplex stuff pump
1—Shartle Miami 10 x 20 triplex stuff pump
4—Noble & Wood Monarch Jordans
4—Noble & Wood Mammoth Jordans
1—E. D. Jones Imperial Jordans
2—Shartle Miami 00 Jordans
1—Shartle #4 Hydrafiner
1—Weiner refiner
3—12-plate Packer screens
3—10-plate Packer screens
2—10-plate Beloit screens
1—Valley Iron Works breaker beater
2—Valley Iron Works screw presses
1—#14 Cameron winder, 126" wide
1—53" Beloit single cutter
1—72" Moore & White 4-drum winder
1—116" Moore & White 4-drum winder
1—160" Cameron slitter
1—Voith Inlet, 127" wide
2—36 x 104" cylinder molds and vats
1—600 ton Hydraulic press with accumulator and pumps
12—48 x 106" dryers

SHARTLE BROS. MACHINE CO.
Middletown, Ohio A-29

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Asten-Hill, Ltd.
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OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE
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The machine or the material you urgently need may be advertised right here in these columns.

Read Them, Use Them—If you need something, advertise for it—If you have something to sell tell the industry about it—Everybody reads the Clearing House.

FOR SALE

1—156″ Beloit Fourdrinier Paper Machine with 28 Dryers, 48″ diameter, 3 felt dryers, drives, reels, etc. Now running. Delivery in October.

1—138″ Beloit Fourdrinier Paper Machine, 31 Dryers, 48″ dia. 3 Felt dryers, drives, etc. Can be seen in operation. Delivery April 1st, 1947.

5—Shartle cast iron tub breaker Beaters, roll 80″ dia., 55″ face, anti-friction bearings. Used less than 1 year, ready for immediate shipment.

1—66″ face, 60″ dia. Valley Bandless Roll with stands & Pulley. Would make good breaker beater.

1—Dilts New Type cast iron tub Beater, 2000# capacity with keyed type bandless roll, also Hexagon Washer, 48″ x 54″. Prompt delivery.

1—Horne 54 x 66″ Roll Patented Beater Tub of 4″ cypress, 1800# capacity. This beater used about 6 years and is in excellent condition.

2—No. 1 Dillon Jordans, three-bearing, belt-driven type, fully reconditioned.

1—Appleton No. 2 Jordan. New fillings to suit your work.

1—Noble & Wood Pony Monarch, belt-driven type. Reconditioned.

1—8″ Weiner Refiner, anti-friction bearings. Plug type control valve.

2—88″, 9 roll Calender Stacks with Marshall Drives.

1—2-spool Pusey & Jones Reel, 112″ face, complete with friction drives.

1—Beloit drum type tissue reels for 122″ machine.

1—Beloit extra heavy pair two-spool vertical reel, spools 18″ dia., 126″ face complete with drive.

1—112″ Langston Slitter and Winder, two drum with rider roll will make rolls up to 60″ dia. A good board, or felt mill winder.

2—106″ Pusey & Jones two-drum Slitters & Winders, reconditioned.

1—88″ Warren drum Slitter & Winder, reconditioned.

1—106″ Horne Rotary Sheet Cutter, single.

1—70″ Hamblet Rotary Sheet Cutter with motor drive and back stand.

3—Vertical inclosed Agitator Drives designed for belt driving. 5 H.P. Motors.

2—Pair ten-roll Calender Stacks, box frames.

1—No. 2 Bird Screen with copper lined vats. Plates cut to suit.

2—Marshal Drives complete with Moore & White friction bevel gears, double reduction spur gears.

2—No. 1 Reeves Drives 3½ to 1 speed reduction.

1—48″ dia., 84″ face creping dryer.

1—48″ dia., 120″ face dryer.

1—10 x 20″ Shartle Triplex plunger stock pump.

1—Shartle 8″ x 16″ duplex plunger stock pump.

1—Shartle 8 x 18″ Triplex plunger stock pump.

2—7 x 16″ Beloit duplex plunger stock pumps.

1—8 x 16″ Beloit Triplex plunger stock pumps.

2—Beloit 10 x 14″ Triplex stock pumps.

1—NEW Gould Triplex boiler feed water pump, 5 x 8″ (Navy Surplus).

2—Warren Centrifugal stock pumps, 14″ inlet 6″ outlet, 900 GPM 250 ft. head, bronze impellers.

1—Frederick open impeller centrifugal stock pump, 1800 GPM 75 ft. head, 12″ inlet, 10″ outlet, bronze impeller.

2—Domestic open impeller stock pumps, 2100 GPM, 28 ft. head, 10″ inlet, 8″ outlet.

1—Domestic 8″ x 8″ open impeller stock pump, anti-friction bearings, 1400 GPM, 28 ft. head.

1—Midwest (Hill Pump Co.) open impeller stock pump, 1000 GPM, 180 ft. head.

2—Domestic open impeller stock pumps, 240 GPM, 40 ft. head, 4″ inlet, 4″ outlet.

1—Warren Centrifugal 18″ inlet, 5″ outlet, 200 GPM, 270 ft. head.

1—DeLaval Centrifugal water pump, 1550 GPM, 60 ft. head, 8″ inlet, 8″ outlet.

6—Gould Centrifugal high pressure pumps, 100 GPM, 104 ft. head, direct connected to 5 HP 220-440 volt motors.

1—Ingersol Rand Centrifugal water pump, 500 GPM, 104 ft. head, direct connected to 20 HP, G. E. Motor. This complete unit purchased new 1944.

6—NEW GOULD all bronze centrifugal water pumps, 200 GPM, 150 ft. head, stainless steel shafts, monel metal sleeves (Navy Surplus).

4—NEW GOULD 10,000 GPM all bronze casings (Navy Surplus).

20—New Gould, all-bronze centrifugal open impeller stock pumps, 300 GPM, 50 ft. head. (Navy Surplus).

800 Feet—New copper and brass tubing, 6⅝″ dia., 8¾″ dia., will make new felt and wire rolls with or without steel pipe reinforcing any length up to 20 ft. (War Surplus).

1200 ft.—New 3¼″ Phosphor bronze tubing extra heavy, will make this into fourdrinier table rolls, any length, perfectly balanced.

The largest stock of Brass covered press rolls, rubber covered press rolls and calender rolls anywhere.

Every item guaranteed.

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OSBORNE PAPER MILL EQUIPMENT CO.

FULTON, N. Y. **A-29**

FOR SALE

FOR SALE—One Lane and Bodley 150 HP Engine and 100 KW Generator; One Chuse (variable speed) 165 HP Engine and 100 KW Generator. Both generating sets belt driven and 220 volt. Loroco Industries Inc., Lancaster, Ohio. A-29

FOR SALE—Smith and Winchester ¼ bbl. Bottomer and Medium Tuber Paper Bag Sack Machine for single or duplex satchel bottom bags, run singly or as one machine producing finished sack. Address Box 46-585 care Paper Trade Journal. A-29

FOR SALE—Cellophane. Available in small cut size sheets, either moistureproof or plain. Fairly prompt delivery. Address Box 46-603 care Paper Trade Journal. TF

FOR SALE—Bag Machines—Self Opening type—in good condition—can be seen in operation. Address Box 46-604 care Paper Trade Journal. S-5

WANTED

WANTED—12 paper mill dryers 80 to 85″ face 36″ diameter rolls. Ohio Paper Co., Miamisburg, Ohio. S-5

WANTED — Embossing Press, 10 x 15 or larger, with gold leaf attachment. Address Box 46-593 care Paper Trade Journal. A-29

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED

WANTED BOARD MACHINES

From 60 to 80″ wide to produce paper boards, such as Chip, News, Kraft, etc. from paper waste or pulp in .016 caliper and up. Will consider moving plant or operating where ours is. Will buy outright or trade with our paper box machinery for corrugated, solid fibre, setup and folding boxes. Address Box 46-497, c/o Paper Trade Journal. A-29

WANTED—Paper Board Machine capable of producing 35 to 100 tons folding box board daily. Replies held in strictest confidence. Address Box 46-525 care Paper Trade Journal. A-29

WANTED — W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 46-32 care Paper Trade Journal. TF

WANTED—Brightwood Box Machine. Address Box 46-33 care Paper Trade Journal. TF

WANTED—Yankee Dryers, preferably 100″ up. Address Box 46-573 care Paper Trade Journal. A-29

WANTED—Four room apartment—Cleveland or vicinity. Address Box 46-298 care Paper Trade Journal. TF

WANTED—Newsprint or equivalent California sheeted preferred, 42 x 46, but can sheet rolls. Can use hundred fifty tons yearly. What have you? Address Box 46-583 care Paper Trade Journal. A-29

WANTED

PAPER MILL WANTED

Complete small or medium size mill in midwest, south, north or western section of nation. Advise full details and price immediately. Address Box 46-595 care Paper Trade Journal. A-29

"We Urgently Need Immediately for Export 5000 Tons or More of Newsprint Paper in Rolls or Sheets. Wire or Write Offer to Box No. 46-607 care Paper Trade Journal. S-19

WANTED—Beck Sheeter for immediate shipment. BLEYCO PAPER CORP., 214 Sullivan St., New York, N. Y. A-29

WANTED—One or two Dryers 36″ diameter —60″ to 64″ face, 88″ to 92″ over-all dimensions. York Paper Manufacturing Co., P. O. Box 189, York, Pa. S-5

WANTED—Three or four color rotary press for printing paper bags; and one half barrel bottomer. Must be in good condition. Give full details. Address Box 46-587 care Paper Trade Journal. TF

WANTED—Straight pass enclosed drier to handle paper coating process. Also paper coating equipment. The Process Manufacturing Company, 1313 West Randolph Street, Chicago, 7, Illinois. TF

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Operates smoothly at speeds up to 2000 FPM on paper 1200 FPM on board handles widths from 73" to 162"

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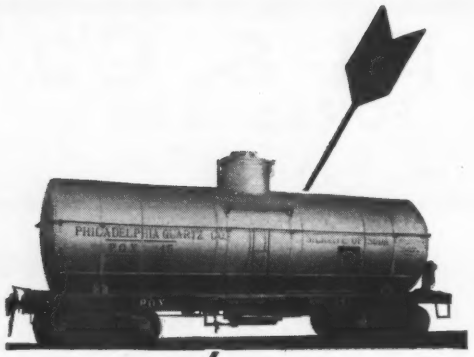

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6 Beater size—"S" Silicate improves finish and strength.

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Dept. B, 121 S. Third Street, Philadelphia 6

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ABRASIVES
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American Resinous Chemicals Corp.
Arabol Mfg. Co.
Flintkote Company
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National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
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Biggs Boiler Works Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Hardinge Co., Inc.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
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Valley Iron Works Co.

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Montague Machine Works
Raybestos-Manhattan Inc. Manhattan Rubber Division
Rollway Bearing Co.
Shartle Brothers Machine Co.
SKF Industries, Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

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The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

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Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

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The Cincinnati Rubber Mfg. Co.
Raybestos-Manhattan Inc. Manhattan Rubber Division
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United States Rubber Co.
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The Biggs Boiler Wks. Co.

BLEACHING APPARATUS
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Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
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The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.

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Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

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Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
The Borden Company
Casein Company of America

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Grinnell Company
Hamblet Machine Co.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.

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Walworth Company

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De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Eng. Co.
Shartle Brothers Machine Co.

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Amer. Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
The Cowles Detergent Co.
Diamond Alkali Co.
Dispersion Process, Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Falls Chemical Products Co.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
Mallinckrodt Chemical Wks.
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
The Cowles Detergent Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Monsanto Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Hardinge Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Stearns Magnetic Mfg. Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Mayer Machine Co.
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corporation, John
Weber, Herman G.

COCKS, LUBRICATED PLUGS
American Car & Foundry Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machy. Corp.

CONDENSERS
Foster Wheeler Corp.

CONSULTING ENGINEERS
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Alvin H. Johnson & Co., Inc.
The Kohler System Company
Main, Inc., Chas. T.
The McPherson Company
Roderick O'Donaghue
The Rust Engrg. Co.
J. E. Sirrine & Co.
South Wabash Engrg. Co.
Stone & Webster Engrg. Corp.

CONTROLLERS
Black-Clawson Co.
Cochrane Corp.

CONTROLS
The Bristol Company
Cochrane Corp.
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.

COOLING SYSTEMS
Foster Wheeler Corp.
Steamaire Company

CORES
Elixman Paper Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CRANES
Northwest Engrg. Co.
Reading Chain & Block Company

CRUSHERS
Fibre Making Processes, Inc.

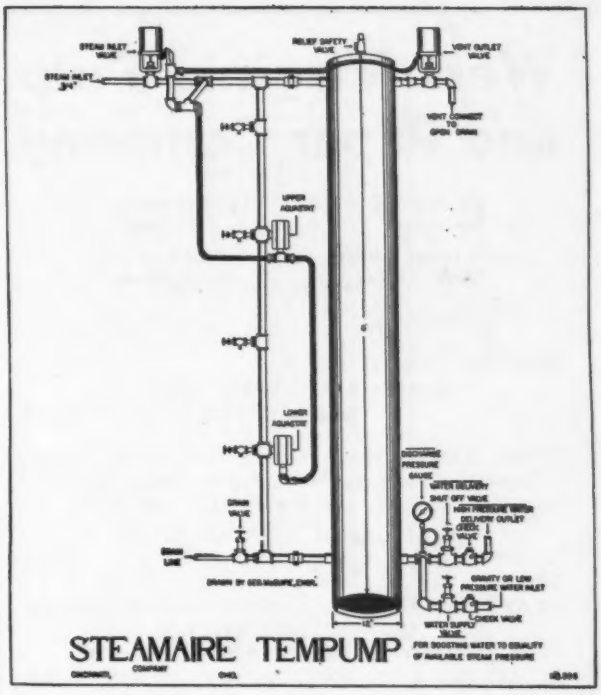
CUTTERS
Dilts Machine Works
Thomas W. Hall Co.
Noble & Wood Machine Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Steamaire Company
Valley Iron Works Co.

DE-INKING
Dilts Machine Works
Hardinge Co., Inc.
Kinsley Chemical Co.
Shartle Bros. Mach. Co.

DIGESTERS
Biggs Boiler Works Co.
Foster Wheeler Corp.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company



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Covington, Virginia
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Montague Machine Co.
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Shartle Brothers Machine Co.

DOCTOR BLADES

Black-Clawson Company
Lodding Engrg. Corp.
Montague Machine Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS

Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, I. O., Engineering Corp.
Ross Paper Machy. Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIVES

Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DRUMS

Fibre Making Processes, Inc.

DUSTERS

Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS

Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EMBOSSING ROLLS

Northern Engraving & Mch. Co.
Roehlen Engraving Co.

EVAPORATORS

Black-Clawson Company
Foster Wheeler Corp.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

FANS

General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS

Fibre Making Processes, Inc.
Hardinge Co., Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

FELTS

Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co., Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.

FELT CONDITIONERS

Steamaire Company

FELT GUIDES

Moore & White Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS

Aluminum Flake Co.
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
Amer. Resinous Chemicals Corp.
Johns-Manville Sales Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS

Cochrane Corp.
Hardinge Co., Inc.
Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Worthington Pump & Machy. Corp.

FLOORING, GRATING & TREADS

Hendrick Mfg. Co.
Klemp Co., W. F.
Norton Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

FORMING MACHINES

Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.

FRICTION MATERIALS

Johns-Manville Sales Corp.

FREENESS TESTERS

Testing Machines, Inc.

GEARS

Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS

Carthage Machine Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Wks.

GRINDING WHEELS

The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Norton Company
United States Rubber Co.

HEAT EXCHANGERS

Foster Wheeler Corp.

HEAT RECOVERY SYSTEMS

Foster Wheeler Corp.

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Armstrong Machine Works
Cochrane Corp.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthington Pump & Machy. Corp.

HOISTS

Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.
Reading Chain & Block Corp.

HOSE (Air, Water, Suction, etc.)

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Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

WHERE TO BUY

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Steamaire Company

HYDRAPULPERS
Ross Paper Machy. Co.

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Cochrane Corp.
The Foxboro Company
General Electric Company
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Wallace & Tiernan Instrument Co.

INSULATION
Johns-Manville Sales Corp.

JOINTS
Perfecting Service Company

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Valley Iron Works Co.

KNOTTERS
Fibre Making Processes, Inc.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LINTER COTTON
The Railway Supply & Mfg. Co.

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MATERIAL HANDLING
Automatic Transportation Co.
Northwest Engrg. Co.
Reading Chain & Block Company

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.
Steamaire Company

MOISTURE CONTENT CONTROL
Spray Engrg. Company
Steamaire Company

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Continental Electric Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

NOZZLES
Spray Engrg. Company
Steamaire Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
Johns-Manville Sales Corp.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Bagley & Sewall Co.
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Wks.
Valley Iron Works Co.

PAPER MILL BUILDERS
Merritt-Chapman & Scott Corp.
The Rust Engrg. Co.

PAPER TUBE MACHINERY
Theo. Adams
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
South Wabash Engrg. Co.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corp., John

PENSTOCKS, WELDED STEEL
The Biggs Boiler Works Co.

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Deublin Company
Grinnell Company
Johns-Manville Sales Corp.
Shartle Brothers Machine Co.
Stowe-Woodward, Inc.
Taylor Forge & Pipe Works
Walworth Company

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLATE WORK (Steel & Alloy)
The Biggs Boiler Works Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSURE VESSELS, STEEL AND ALLOY
The Biggs Boiler Works Co.
Foster Wheeler Corp.

PRESSES
Black-Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Fibre Making Processes, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
South Wabash Engrg. Co.
Valley Iron Works Co.
Waldron Corp., John
Weber, Herman G.

PULPERS
Bauer Brothers Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Lyddon & Co. (America) Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULPSTONES
Norton Company

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Buffalo Pumps, Inc.

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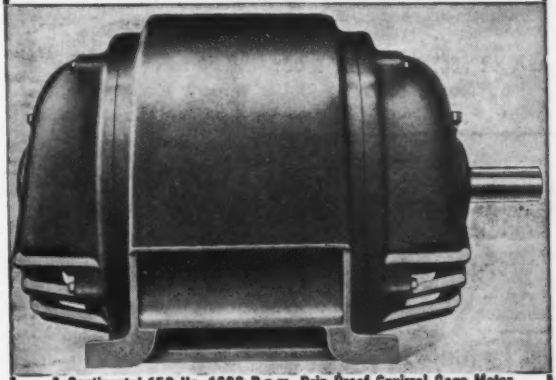

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Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Steamaire Company
Warren Steam Pump Company
Worthington Pump & Mchy. Corp.

RAG CUTTERS
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

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Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp., J. O.
Valley Iron Works Co.

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Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
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Murray, D. J., Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
Cochrane Corp.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
Amer. Cyanamid & Chemical Corp.
Amer. Resinous Chemicals Corp.
Monsanto Chemical Co.
The Resinous Prod. & Chem. Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Philbrick Engrg. & Machine Co.
Pusey & Jones Corp.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
Roehlen Engraving Co.
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
Stowe-Woodward, Inc.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward, Inc.

ROLL STANDS
Cameron Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.

ROOFING MATERIALS
Johns-Manville Sales Corp.

ROTARY BOILERS
Biggs Boiler Works

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bulkley, Dunton Pulp Co., Inc.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
Amer. Cyanamid & Chemical Co.
Amer. Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Flintkote Company
Monsanto Chemical Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Socony-Vacuum Co.
Stein, Hall & Co., Inc.

SLIME CONTROL
Falls Chemical Products Co.
Magnus Chemical Co.
Mallinckrodt Chemical Wks.

SLITTERS
Theo. Adams
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
The Biggs Boiler Works Co.

SOLENOID VALVES
Steamaire Company

WHERE TO BUY

SPRAYING EQUIPMENT
The Spray Engineering Co.
Steamaire Company
STAINLESS STEEL
Anti-Corrosive Metal Products Co., Inc.
STARCH
Amer. Cyanamid & Chemical Corp.
Clinton Industries, Inc.
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Stein, Hall & Co., Inc.
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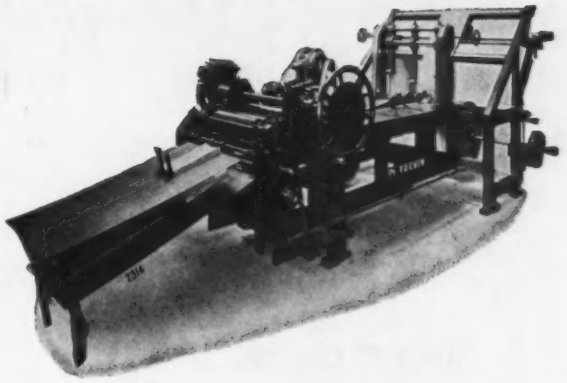

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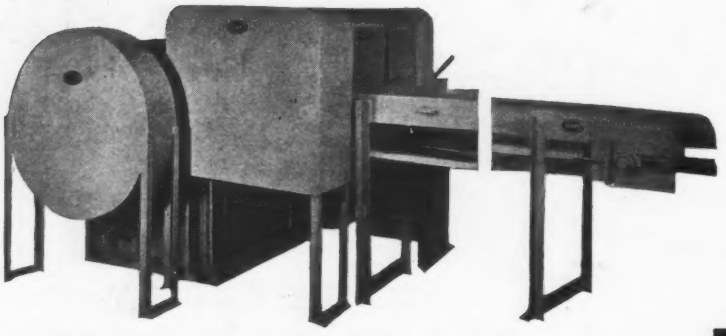

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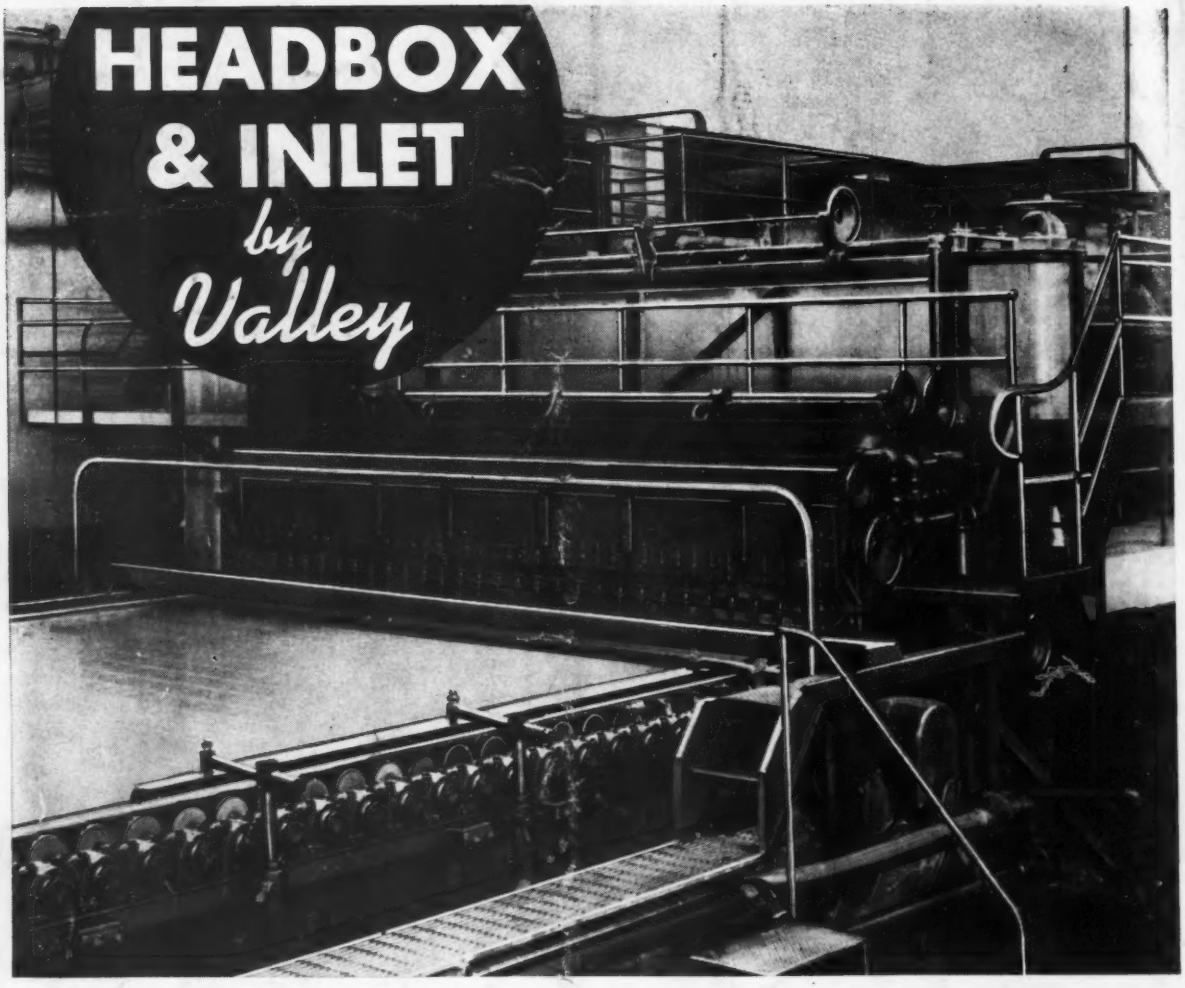

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